Long Island Sound
Dredged Material Containment
Feasibility Study

MARKET USER SURVEY FOR SELECTED LONG ISLAND SOUND PORTS

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MARKET USER SURVEY FOR SELECTED LONG ISLAND SOUND PORTS

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INTRODUCTION

I. INTRODUCTION

A. Study Purpose

The work documented herein is intended to inform Corps of Engineers planners of on-going activities in fifty (50) Rhode Island, Connecticut, and New York ports and harbors located on Long Island Sound. In addition, projections are made of port activities based on identified trends, planned port development, and anticipated changes in shoreline activities, including possible conversion of electrical generating plants from oil to coal. The level of identified demand for harbor improvements will aid in projecting future dredged material volumes in Long Island Sound. The 50 ports and harbors of interest are located and listed on the map of Figure I-1.

This Market User Survey is conducted under sponsorship of the New England Division, Corps of Engineers, under authority derived from a resolution adopted on 10 May 1977, by the Committee on Public Works and Transportation of the United States House of Representatives. That Resolution authorized the Long Island Sound Dredged Material Containment Study. The overall objective of the Containment Study is to determine the feasibility and impacts of creating several artificial islands or diked shoreland extensions to accommodate dredged material in Long Island Sound. Containment is a primary alternative to open-water disposal of dredged materials.

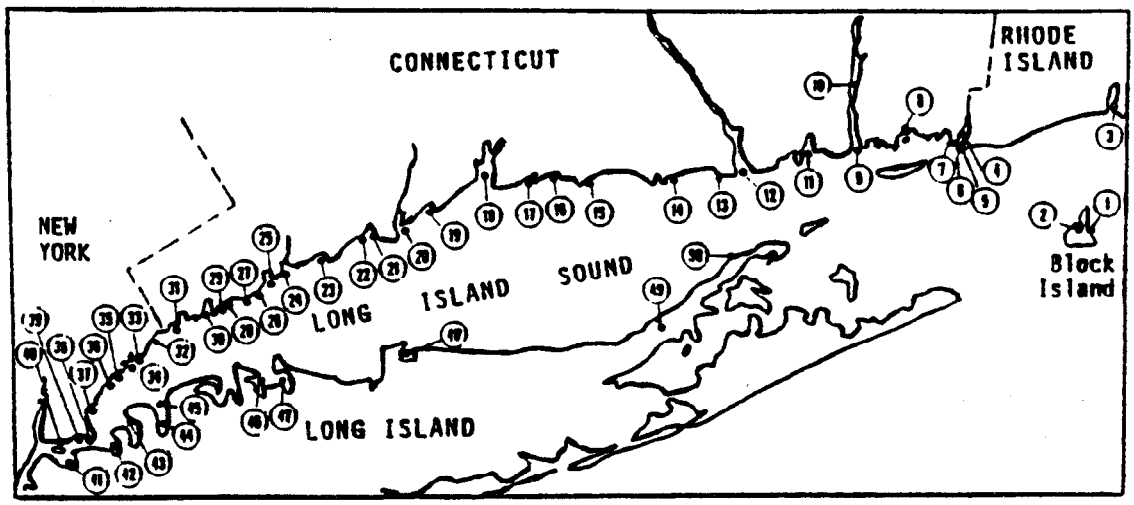
B. Scope

Information developed for each of the subject ports includes the following:

(1) Existing port uses, for the major commercial ports, including types and quantities of commodities imported and exported, shorefront facilities, vessel types commonly accommodated, and navigational problems. Existing levels of activity at smaller, primarily recreational ports, are addressed in terms of available anchorage space, demand indicators, and trends toward recreational vessels with deeper draft requirements.

(2) Projections of future activities for the subject ports based upon knowledge of historical and ongoing trends, availability of developable shorefront land, and existence of port facility development plans. Changes in channel conditions to accommodate probable changes in port use or fleet characteristics are of particular interest to Corps of Engineers planners.

(3) A "no-action" scenario is developed which details potential economic impacts if no solution to the dredged material disposal problems is found.



1 Block Island Harbor
2 Great Salt Pond
3 Point Judith Harbor
4 Pawcatuck River
5 Watch Hill Cove
6 Little Narragansett Bay
7 Stonington Harbor
8 Mystic River
9 New London Harbor
10 Upper Thames River
11 Niantic Harbor
12 Connecticut River
13 Patchogue River
14 Clinton Harbor
15 Guilford Harbor
16 Stony Creek
17 Branford Harbor
18 New Haven Harbor
19 Milford Harbor
20 Housatonic River
21 Bridgeport Harbor
22 Black Rock Harbor
23 Southport Harbor
24 Saugatuck River & Westport Harbor
25 Norwalk Harbor
26 Wilson Point Harbor
27 Five Mile River
28 Westcott Cove
29 Stamford Harbor
30 Mianus River
31 Greenwich Harbor
32 Port Chester Harbor
33 Milton Harbor
34 Mamaroneck Harbor
35 New Rochelle Harbor
36 Echo Bay Harbor
37 East Chester Creek
38 West Chester Creek
39 Bronx River
40 Flushing Bay
41 East River
42 Little Neck Bay
43 Manhasset Bay
44 Hempstead Harbor
45 Glen Cove Creek and Harbor
46 Huntington Harbor
47 Northport Harbor
48 Port Jefferson Harbor
49 Mattituck Harbor
50 Greenport Harbor

FIGURE I-1. Long Island Sound Ports and Harbors

(4) Potential uses of land created by dredged material containment structures in Long Island Sound are addressed in a preliminary manner based on present and anticipated future demand for shoreline facilities and water transport. Four possible containment sites have been identified, including: approximately 90 acres at Clinton Harbor; approximately 100 acres at Fayerweather Island (see Black Rock Harbor); 50 acres at Yellow Mill River (see Bridgeport Harbor); 20-30 acres at New Haven Harbor; and approximately 100 acres at Two-Tree Island, Waterford (see New London Harbor).

C. Approach

A straight-forward approach was used to identify and obtain information relevant to the objective and scope of the Market User Survey. The point of departure consisted of existing literature sources, such as annual reports of the Department of the Army entitled Waterborne Commerce of the United States, Part I, and frequently revised reports entitled Port Series. Other overview-type literature sources, such as the reports of the Long Island Sound Regional Study, were reviewed and incorporated into the study data base. But the largest and most important sources of information consisted of interviews with individuals knowledgeable of conditions in each of the subject ports. Direct, face-to-face interviews and telephone interviews were conducted with major channel users; local port authorities; Chambers of Commerce; State, regional, and local planning agencies; and local harbor masters and municipal yacht club officials. Most interviews were conducted by telephone. Discussions were also held with staff of the U.S. Department of Energy; the New England Division and New York District, Army Corps of Engineers; State energy agencies; and the individual electrical utilities regarding the oil-to-coal conversion issue. Almost without exception, persons responding to survey questions were polite and informative.

Documentation proceeded along two parallel paths in accord with the general focus of information obtained; that is (1) harbor specific and (2) regional. Detailed harbor-specific information was incorporated into a Harbor Monograph, each addressing (a) an overall description of the geography of the harbor and adjacent lands; (b) existing commercial shipping and recreational boating uses, and (c) projections of harbor activities (including a brief assessment of the "no-action" scenario). A brief review of the population, energy and economy of the Long Island Sound Region was conducted to provide perspective on the present and projected future regional setting within which Long Island Sound port and harbor activities will take place. Details on oil-to-coal conversion of electrical energy generating plants are presented in the individual Harbor Monographs.

This report is organized into three sections beginning with this Introduction. Section II presents a summary of results obtained. Section III contains the fifty (50) harbor monographs which detail existing and projected conditions at each of the subject ports and harbors.

II

SUMMARY

II. SUMMARY

Information obtained and documented during the conduct of the Market User Survey allows some general statements to be made.

- The Long Island Sound (LIS) shoreland has a 1980 population of almost 8.5 million people living on an area of about 4000 sq mi. This computes to a combined average population density of 2125 persons/sq mi. The average population density in the four Connecticut shore counties is 853/sq mi, while in the five New York shore counties, it is 3600/sq mi. These high population densities contribute to the importance of the Sound as an avenue for commercial shipping as well as the basis for and regional variations in demand for high quality water-based recreation.

- The 1980 Census Data show the LIS region's population dropped by more than 5 percent in just 10 years. Most of this loss occurred in the New York City metropolitan area and is generally due to the impacts of the high cost of energy and living, crowding, and the decline in trade, manufacturing and employment. There are indications that Connecticut's modest population and employment growth is at the expense of New York City. Connecticut's high per capita income and ability to maintain its manufacturing base and increases in nonmanufacturing (i.e., service) employment appears to provide support for continued albeit modest growth. There exists a significant and growing middle income populace to realize recreational benefits through boating on Long Island Sound.

- Electrical energy generation, as well as the rates of consumption by residential, commercial and industrial consumers throughout the Northeast, has remained almost constant during the 1976-1979 period. In the near-term (i.e., next 10 years) there is the possibility that several small, old steam-electric power plants that once burned coal and were converted to oil to meet the 1970 Clean Air Act requirements may convert back to coal. Facilities in the LIS region which have tentative plans to convert to coal are included in Table 1 (Ref. 1). There remains a possibility that the Bridgeport generating unit may convert to coal (Ref. 2) although utility company representatives did not mention this in recent discussions (Ref. 3). Bridgeport could require a coal tonnage of 0.7 to 1.0 million tons per year (tpy) (Ref. 2). Non-utility demand in Connecticut is estimated to be 28,000 tpy.

- The conversion-to-coal situation is quite uncertain at the present time due to a number of related issues currently being investigated, including: 1) air and water quality regulatory requirements; 2) alternative transport options (e.g., rail-to-port-to-vessel-to-plant; rail-to-plant; rail-to-port-to-vessel-to-port-to-plant); 3) alternative sources of coal; and 4) potential for a regional stockpiling facility and subsequent transshipment on barges. The possibility of burning "dirty" coal (2.2% sulfur) is considered low by some, and coal conversion may never occur (Ref. 3).

- LIS commercial ports are primarily characterized as petroleum ports which makes the conversion to coal issue so important. Overall commercial tonnage has decreased during the past decade and LIS ports (excepting the New York city area) are not expected to capture a significant portion of future new commercial shipping volumes such as generated by the trend to containerization (Ref. 4). However, commercial shipping will continue to provide an important and economical basis for movement of commodities to or from local hinterlands.

TABLE 1

Facility	Harbor	Rating (MW)	Estimated Conversion Date	Estimated Coal Tonnage
Norwalk #1	Norwalk	160	1/85	0.9
Norwalk #2	Norwalk	172	7/85	
Devon #7	Housatonic R.[1]	107	1/86	0.6
Devon #8	Housatonic R.[1]	107	1/86	
Mount Tom #1	New Haven[2]	145	1/82	1.0
W.Springfield #1	New Haven[2]	51	1/86	
W.Springfield #2	New Haven[2]	51	1/86	
W.Springfield #3	New Haven[2]	107	1/85	

Notes: 1. Could be serviced by Bridgeport Harbor rail connection (Ref. 2).
2. Possible rail connection from New Haven (Ref. 1).

- A need for dredging LIS harbors is articulated by users of the majority of harbors. Evidence includes numerous groundings, routinely waiting on the tide, harbor congestion, and lightering offshore. Without dredging, many marinas claim a loss of business due to inadequate channel and anchorage basin depths.

- There is a very strong demand for recreational boating facilities. A great majority of marinas have waiting lists for available slips. This demand is particularly evident in western LIS. There is a definite trend toward sailboats with fixed keels as opposed to power boats. New boat buyers seem to prefer sail (and fiberglass hulls), although those who own large power boats are not rushing to trade away. This trend is based, in part, on higher fuel costs as evidenced also by a perceived trend of shorter trips by power boats. Fixed keels draw more water than a power boat, necessitating deeper or more frequently maintained channels and marina areas.

- The costs of dredging and disposal can be an important factor in reaching a decision on whether to actually proceed with a project in a local area. With cooperative efforts between marina owners and shipping interests, and coordination with a Federal project, dredging costs can be reduced. Marine interests in a community may not be strong enough to motivate public funding for dredging projects. However, in some harbors marina interests have offered direct financial contributions to the local share of a Federal project (e.g., Clinton Harbor).

- Environmental constraints vis-a-vis local disposal site availability are viewed as a significant contribution to increased project costs. Two examples include: (1) the distance to an approved regional disposal site, and (2) the lack of suitable available land for disposal. This is most evidenced in western Long Island Sound.

- Community planning authorities in many LIS ports and harbors seem to be seeking to realize multiple-use benefits from their ports and harbors. Redevelopment of aged facilities to support varieties of commercial, recreational, and other amenity-related uses is being promoted. Municipal zoning ordinances excluding non-marine commercial and residential developments have been implemented in many harbors.

- There is a tremendous demand for shorefront real estate not necessarily dependent on shorefront location, particularly in western LIS. There is a general lack of developable land in the great majority of harbors, and real estate value escalation is putting even available land out of reach of all but high value condominiums. Many marine-related enterprises have been bought out and many others are having difficulty hanging on.

References

1 Northeast Power Coordinating Council, Regional Reliability Council, Long Range Coordinated Bulk Power Supply Programs, April 1, 1981.

2 Fay, Spofford and Thorndike, Inc., Connecticut Coastal Energy Impact Program: Port/Rail Energy Transportation Project. Interim Report, July 1980.

3 Private Communication (Mr. Willaim McCawley, Director, Fuel Purchasing, Northeast Utilities), May 8, 1981.

4 Commission and Temple, Barker and Sloane, Inc., Roles for New England Ports (Tasks 4.2 and 43.), Draft Final Report, New England River Basins, November 1980.

III

LONG ISLAND SOUND PORTS AND HARBORS

1

BLOCK ISLAND HARBOR (Old Harbor)

1.0 Harbor Description

The Old Harbor of Block Island is located in the township of New Shoreham, on the east side of Block Island, 1.4 miles northward of the Southeast Light (Ref. 1). The harbor, constructed in 1935 after the hurricane (Ref. 2), is a frequently used, self-contained artificial harbor, formed by two breakwaters. The east breakwater extends about 300 yds northward of the entrance of the inner harbor; marked by a light and fog signal. The west breakwater forms the west and north boundaries of the harbor for a total area of nearly 13 acres. In 1976 the controlling depth in the 100-ft-wide entrance channel was 12 ft, with depths of 8 ft in the inner harbor anchorage (except for shoaling to 2½ ft along the northern and western edges), with 12 ft in the basin in the southeast corner (Ref. 1). The harbor is primarily used by pleasure craft during the summer season, and fishing vessels during the winter. The eastern part of the inner harbor is left clear for the passage of the ferry to the wharf. The basin in the southeast corner is usually occupied by fishing boats and local craft.

The harbor was dredged 5 years ago, but due to shoaling brought in by the tidal flow, the basin and channel are filling in, causing over-crowding in the available anchorage space. The attached photo, taken on Labor Day 1977, graphically points out the hazardous situation, where boat owners and town officials greatly fear the possibility of a fire outbreak. (Ref. 2)

The ferries sometimes have problems getting in at low tide. Larger vessels must wait for the tide to rise for access into the harbor.

2.0 Harbor Uses

2.1 Industrial/Commercial

Block Island, a small island about eleven miles from the mainland, is totally dependent on waterborne cargo for its survival. It has a population of about 500 people in the winter months which rises to about 5000 during the summer months (Ref. 3). Four or five ferries come into the Old Harbor daily: from New London, CT; Providence, RI; and Pt. Judith, RI. The ferries transport basic living supplies, mail, vehicles, and passengers, who, for the most part, provide a tourist trade that is one of the primary industries on the island. The ferries also provide the means for which much of the commerce generated on the island is brought back to the mainland. Barges come in to Old Harbor, carrying lumber and trap rock and bring back to the mainland old discarded cars (Ref. 2). A Mobil oil barge brings in about 30,000 gals of

gasoline once a month during the winter and about twice a month during the summer. (Ref. 2)

Fishing is the other primary industry. About 80 commercial fishing vessels occupy Old Harbor during the winter months. However, during the summer, due to over-crowding of pleasure crafts, the fishing fleet mostly uses the Great Salt Pond Harbor. (Ref. 2)

2.2 Recreational

The Old Harbor summer activity consists primarily of transient recreational vessels, at a ratio of about 9 power boats to every sail. In 1980 there was an estimated 570 boats that made use of this small harbor. Dock space is used exclusively for power craft of up to a 70-ft maximum. Sailing vessels, as large as 110 ft, have anchored in the basin. (Ref. 2)

3.0 Projected Harbor Activities

Harbor users and town officials stress that the life cycle of the island is dependent on the harbor activities. Since both commercial and recreational vessels fuel the island economy, the channel and basin must be kept dredged to the CE specifications. (Ref. 2,3) Growth trends indicate some increase in sail each year. Harbor officials also report a need for larger, more sophisticated, commercial boats as the fishing industry is increasing.

Since many people supplying the tourist trade who come to the island (both by ferry and in private boat) enjoy the open-vista seascapes, the town planners want to keep building under control around the perimeter of the island. Therefore, plans for development in the Old Harbor area are to extend inward toward the center of the island. (Ref. 3)

Town officials plan to put in new town-owned toilet facilities and showers to supplement the existing ferry-owned facilities. (Ref. 2)

References

1. U.S. Department of Commerce. United States Coast Pilot. Atlantic Coast: Cape Cod to Sandy Hook. 15th Edition, National Ocean Survey, Washington, D.C., January 1980.

2 Private Communication (Arthur Maybury, former Harbor Master, Block Island), May 28, 1980.

3 Private Communication (Vincent McAloon, Town planner, Block Island), May 28, 1980.

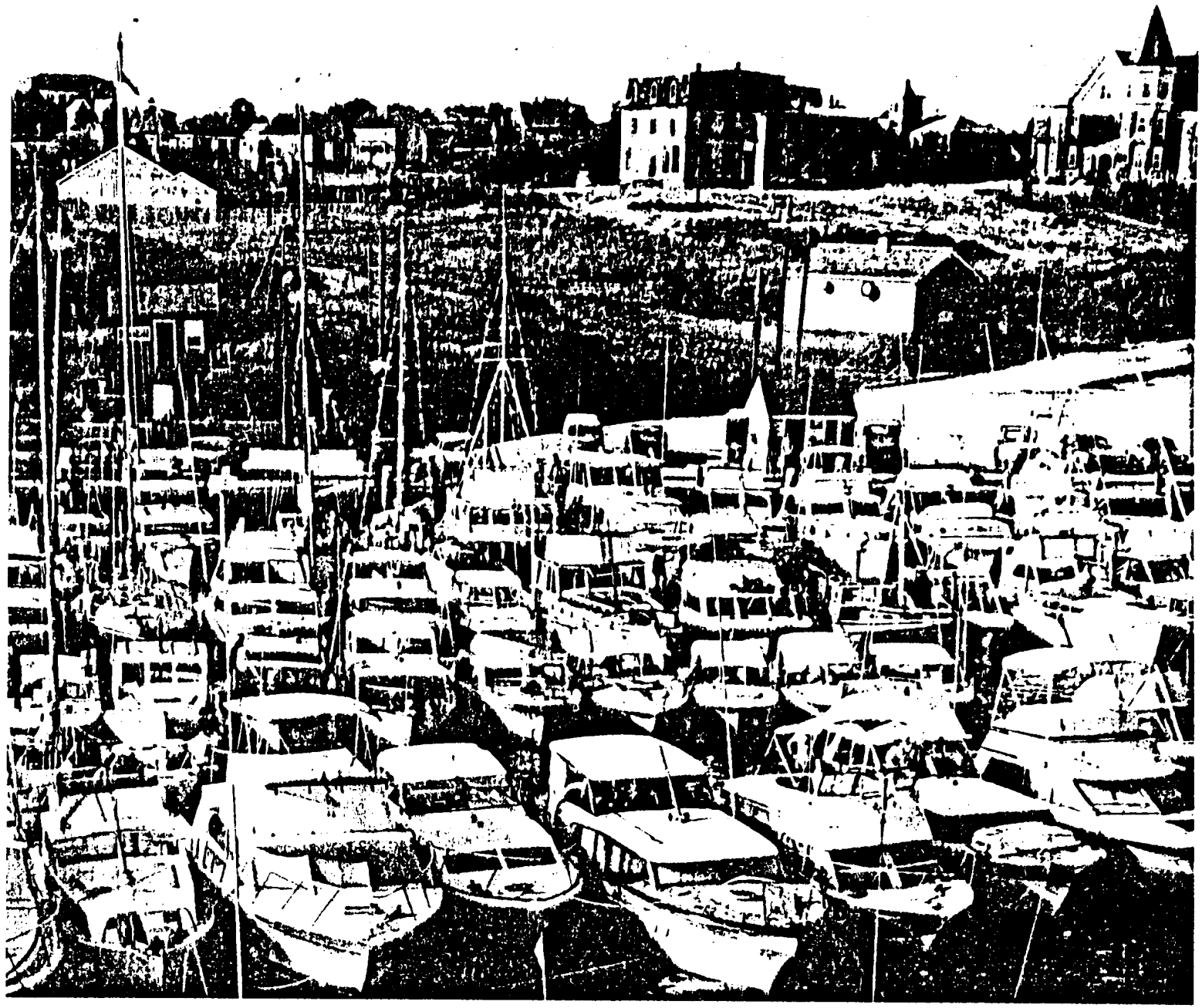


Figure III-1. Old Harbor, Block Island, Labor Day, 1977.

2

GREAT SALT POND, BLOCK ISLAND (New Harbor)

1.0 Harbor Description

The Great Salt Pond (or New Harbor) is a large, open, fairly well-protected harbor, located on the west side of Block Island, in the township of New Shoreham. Because of the low surrounding land, high northerly winds can adversely affect anchorage in the harbor. The one entrance (150-ft width in 1975), about 2 miles south-southwest of Block Island North Light, is a dredged cut through the narrow breachway. The southwestern side of the entrance is protected by a jetty. In August 1975, the controlling depths of the entrance channel, were 16 ft to a point opposite the inner end of the south jetty, to 18 ft in the left outside quarter (5 ft at mid-channel). The usual anchorage in Great Salt Pond is near the southeast end, off the ferry landing, in 15 to 48 ft of water. Mean tidal range is about 2.6 ft. (Ref. 1)

The one narrow entrance creates traffic jams, especially when the cargo vessels come through. The 150-ft wide channel entrance has lost 30 ft or more over the past several years, due to heavy shoaling near the Coast Guard station. A Coast Guard official reported that a drastic yearly channel change due to current inflow-outlfow has caused the gradual increase in shoaling. (Ref. 2) The width change does not present much of a problem in the winter, but the summer problem is severe. Boats have run aground and the Coast Guard has already received one formal complaint by an operator of a sailing vessel that got hung up. Dredging is expected to be done in the fall of 1981, but the Coast Guard, town officials, and harbor users are all concerned that the problem will not be solved in time for the summer season when it is most desperately needed (Ref. 2,3,4). A town planner suggested that part of the shoaling buildup might be caused by sand drifting from the West Beach around the breakwall Horn, and into the channel. As a long-term resident he has noticed a gradual buildup of sand along that west beach and has felt that extending the breakwall might help alleviate the shoaling problem within the channel. (Ref. 3) Shoaling is also creating a problem around the Mobil Oil terminal. (Ref. 4)

A small state airport is located in the south-central part of the island, providing the only means of other than water-borne access to the island.

2.0 Harbor Uses

2.1 Industrial/Commercial

There are two oil terminals in the New Harbor, and one ferry landing at the head of the pond. A deep-water oil tanker, which supplies the Block Island Power Company, comes in about twice a year to the Block Island Oil Terminal. The power company,

located about one mile from the terminal, operates on diesel fuel. The Mobil Oil Company brings to the island about 30,000 gallons of heating fuel oil once a month on a 8-ft draft barge. There are no plans to convert to coal, though the Power Company has installed a wind-generator which is presently supplementing the fuel requirement. On certain dates and times during the summer season, the New London Ferry comes into the New Harbor Landing. In heavy southeasterly weather, the Providence boat uses this harbor, and occasionally a ferry comes in from Montauk Point, NY. (Ref. 4)

2.2 Recreational

The Great Salt Pond is primarily a seasonal (from Memorial Day to the end of September) recreational harbor, about 60 percent sail and 40 percent power. The average sailing vessel is 30 to 35 ft; power boats average 35 ft. Two or three chartered sail boats of up to 100 ft come into the harbor periodically during the season. (Ref. 4) In addition to dock space at the marinas, the harbor offers a large anchorage area that can easily accommodate over 300 vessels. (Ref. 5)

No.	Marina	# of Slips	Maximum Size
1	Champlin's Marina	250	
2	Block Island Boat Basin	100	
3	Payne's New Harbor Dock		
4	Antonio's II	10	35' (power)
5	Block Island Marine		
6	Twin Maples		
		360+	

3.0 Projected Future Activities

Sailing vessels are on a continuing increase. The harbor could easily accommodate more marinas, however town planners have denied permits as they see already an abundance of facilities for pleasure craft (Ref. 3,4). More commercial development is being encouraged at the lower pond area with the intent of building inward toward the center of the island. Tourism is the primary industry on the island, and plans are to keep the perimeter of the island scenic and undeveloped as this serves as one of the main attractions to recreational boaters (Ref. 4).

2

References

1. U.S. Department of Commerce. United States Coast Pilot. Atlantic Coast: Cape Cod to Sandy Hook. 15th Edition, National Ocean Survey, Washington, D.C., January 1980.

2 Private Communication (Capt. Stephen Wild, Chief, U.S. Coast Guard Station, Block Island, RI), May 28, 1981.

3 Private Communication (Vincent McAloon, Town planner), May 28, 1981.

4 Private Communcation (Arthur Maybury, former Harbor Master, Block Island, RI), May 28, 1981.

5 Boating Almanac, Vol. 2, Boating Almanac Co, Inc., Severna Park, MD, 1981.

POINT JUDITH HARBOR

1.0 Description

Point Judith Harbor is in the townships of South Kingston and Narragansett, on the south shore of Rhode Island, west of Narragansett Bay. The Harbor consists of basically two separate areas: the outer harbor (Harbor of Refuge) on the ocean side of the Galilee-Jerusalem narrows; and the inner harbor (Pt. Judith Pond). The harbor channel extends from the Harbor of Refuge along the west side of the pond to the State Pier at Jerusalem, and from there northerly to the turning basin at Wakefield. A branch channel on the east side extends northeasterly from the entrance to the pond to the State Pier at Galilee, and into anchorage areas westward of Galilee. In 1978, the controlling depths were 7 ft to the junction with the Galilee branch channel, from there 12 ft to the State Pier at Jerusalem, then 2½ ft in the dredged sections above Jerusalem to the turning basin at Wakefield, with 6 ft in the basin. The east branch channel has a controlling depth of 15 ft to the State Pier at Galilee, then 12 ft to the anchorage basin southward of Little Comfort Island. (Ref. 1)

1.1 Point Judith Harbor of Refuge

The Harbor of Refuge is located on the west side of Point Judith. It is formed by a main V-shaped breakwater and two shorearm breakwaters extending to the shore. This harbor provides easy access for most vessels, except during a heavy southerly sea. The area within the V-shaped breakwater affords protected anchorage for small craft. There are two entrances into the harbor referred to as East Gap (400 yds wide) and West gap (500 yds wide). (Ref. 1) The mean tidal range in this harbor is 3.1 ft. There are no marinas or piers in the Harbor of Refuge.

1.2 Point Judith Pond

The Pond is a sheltered saltwater tidal pond entered between two rock jetties at The Breachway in the northwestern part of the Harbor of Refuge. The village of Galilee is situated on the east side of the entrance and Jerusalem is on the west. The pond extends 3.3 miles northerly to the town of Wakefield. It is used extensively by small fishing vessels and pleasure craft. Numerous fish wharves are just inside the entrance, harbored at both villages. The north end of the Pond affords good anchorage and a safe harbor for boats with a 4 ft draft or less (Ref. 1). The mean tidal range for the pond is 2.8 ft. Auxiliary roads off Route 1 provide adequate access to Galilee or Jerusalem. The fishing industries rely heavily on trucks to transport their products; Route 108 to Route 1 to the interstate highway system provide good connections for transport. There is, however, no road connector between Galilee and Jerusalem. The

upper portion of the pond is directly off Route 1 with excellent accessibility. Most of the recreational marinas are clustered at this end on the pond, as well as two public ramps, providing boaters with excellent convenience.

1.3 Navigational Problems

Strong tidal currents in and out of the pond have created tidal deltas and a chronic shoaling problem in the harbor. Fishing vessels have encountered increased difficulty with the shallowness of the channel's depth in some places. They have unsuccessfully petitioned for dredging in the lower pond area, and express a frustration that the problem still exists (Ref. 2,3). Vessel owners claim they have had to readjust their vessel specifications by lessening the draft in order to make their vessels fit the channel. They say this temporarily solves their problem with the existing channel but it also makes their vessels less sea-worthy. (Ref. 3)

Harbor officials report that the dumping of quahog shells off the Jerusalem pier is severely adding to the shoaling problem. An attempt is presently underway to help correct this situation. (Ref. 2)

2.0 Harbor Uses

2.1 Industrial/ Commercial

The Harbor of Refuge is used primarily as a traffic way to and from open water for fishing vessels, ferries, charter boats, and small pleasure craft.

Nearly all of the harbor activity is situated on the Pond and dependent on the conditions that exist there. Fishing fleets and the ferry terminal to Block Island, which constitute the commercial activities, are located at the lower end of the pond.

The principal onshore fishing facilities (listed below) are on large parcels of state owned land in Galilee (Ref. 4).

- Point Judith Fishermen's Cooperative
- Dave Handrigan's Seafood and the Galilee Fish Company
- Pier 3 Seafoods and the Fishermen's Coop
- Global Seafoods (the only major fish processor in the port).

State officials report that docking facilities in Galilee, which include 42 piers that extend out from a series of wooden and steel bulkheads, now anchor about 175 commercial fishing boats, 30 charter, and 25 pleasure. Most vessels range in size from 40 ft to 90 ft, with a maximum of 150 ft. (Ref. 2)

The Public Utilities Commission controls the ferry operation to and from Block Island, which is run by the Interstate Navigation Company in Galilee. The terminal runs the ferry on a daily basis with more frequent runs during the on-season months.

No.	Marina	# of Slips	# of Moorings	Maximum Size
Galilee				
1	R.I. State Pier	284		150' (power)
2	R.I. Engine Co. Inc.	6		40'+ (power)
Jerusalem				
3	Skips Dock	5		23' (power)
4	Jim's Dockside, Inc.	45		
5	Kenport Marina	100		35' (power)
6	Snug Harbor Marina	50	4	40'+(power)
7	R.I. Marine Service	45		40'+
8	Pt. Judith Marina	53		40'+
9	Salt Pond Marine Railway	25		40'+(power)
		613	4	

(Ref. 5)

2.2 Recreational

Most all pleasure craft are anchored at marinas in the upper pond area of Point Judith Harbor. The town of South Kingston controls a large parcel of land around the upper pond area (referred to as Marina Park, Ref. 6), which includes 3 marinas* and 2 yacht clubs (Ref. 5).

No.	Marina	# of Slips	# of Moorings	Maximum Size
10	Silver Spring Cove Marina	69		
11	Ram Point Marina*	60	15	35' (power)
12	Stone Cove Marine, Inc.*	150		35'+(power)
13	Long John's Marine*	38		35' (power)
14	Long Cove Marina	45		23' (power)
		362	15	

Marina space in the upper pond, combined with anchorage space at two yacht clubs, provide over 350 slips and 40 moorings currently in use. Slips and moorings are used to full capacity. (Ref. 7)

3.0 Projected Harbor Activities

Galilee is currenty a center of the Rhode Island offshore fishing industry. The needs and interest of the fishing fleet seem to be toward larger boats to accommodate the growing industry. However, harbor users report that boat sizes are dropping due to financial problems with interest rates, the price of fuel, and maintenance problems with the channel (Ref. 2). Planners for dockside facilities are looking to expand and improve the waterfront to accommodate offloading facilities to handle larger volumes of fish and more berth space for lobsterboats (Ref. 4).

The upper pond was last dredged in 1958 by the CE to a depth of 6 ft (Ref. 6). Water depth at the slips and piers of the marinas, yacht clubs, and at the launching ramps is shallow, and dredging projects will be needed (Ref. 8). Rapidly accumulating sediments are filling in the basin and causing channel shoaling. Periodic maintenance dredging is required if the area is to remain navigable. Because of polluted sediment, dredging projects will require land or ocean disposal for the spoil material. Town planners have prepared a comprehensive report (Ref. 6) detailing all aspects of potential area growth. Where most of the immediate needs seem to be toward land-related improvements (that would also attract and convenience boaters), they stress the importance of maintenance dredging in the upper pond, to keep the channel at the CE 1958 specifications, in order to keep their boating industry operating at its present capacity (Ref. 7,8). New projects might include expanding the mooring basin, deepening the channel beyond 6 ft, extending the channel up the Saugatucket, and deepening the water by the east boat ramp (Ref. 6).

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1. U.S. Department of Commerce. United States Coast Pilot. Atlantic Coast: Cape Cod to Sandy Hook. 15th Edition, National Ocean Survey, Washington, D.C., January 1980.

2 Private Communication (Robert Brow, Harbor Master, Galilee, RI), May 27, 1981.

3 Private Communication (Commercial Fisherman, Galilee, RI), May 28,

4 Stephen Sedgwick, Clarkson Collins, Stephen Olsen; Commercial Fishing Facilities Needs in Rhode Island; Coastal Resources Center, URI, Marine Tech. Report. 80, 1980.

5 Boating Almanac, Vol. 2, Boating Almanac Co, Inc., Severna Park, MD, 1981.

6 Town of South Kingstown, Alternative Development Plans for Marina Park, So. Kingstown, R.I., 1981.

7 Private Communication (William Aukerman, Harbor Master, Pt. Judith Pond, So. Kingston, RI), May 28, 1981.

8 Private Communication (Town Planner, Anna Prager, So. Kingston, RI), June 3, 1981.

4

THE PAWCATUCK RIVER

1.0 Description

The Pawcatuck River has its source in south-central Rhode Island at the confluence of the Charles and Wood rivers (Ref. 1). It empties into the northeastern end of Little Narragansett Bay between Pawcatuck Point, CT, and Rhodes Point, RI. The present channel begins near the river's mouth and extends about 4 miles up river to Westerly, RI (Ref. 2). The river provides good well-protected anchorage. The channel specifications, last adopted in 1960, call for a 10-ft depth for the entire channel, 200-ft wide at the mouth of the river to Avondale, 100-ft wide from Avondale to the lower Westerly, RI wharfs, and from there 40-ft wide to the upper wharves. River sedimentation has lowered the channel depths so that vessels with a 6-ft draft now have navigational difficulties on the river (Ref. 3). The tidal range is 2.5 ft at Pawcatuck Point and 2.6 ft up-river at Westerly.

The first real dredging on the river was done for Socony Oil in the mid-1940's. The channel was dug to 10 ft to allow the tankers to go up to the terminal that existed at that time. Since the oil company moved out, and recreational boating replaced the industrial activity, no dredging of the river has been done at all. (Ref. 3)

Major problems on the river seem to directly relate to accumulated shoaling over the years that has created difficult navigational spots along the channel. The Stillman Avenue bridge dam, on the river just north of Westerly, which existed 10 years ago, was partially removed at that time for the purpose of putting in fish ladders. However, the ladders were never put in and the dam was left with the portion removed. Channel user's speculate that this might have caused two negative effects to the channel: 1) lowering of the river thus lower channel depths; and 2) heavier silting of river-borne particles that the dam had previously filtered. Town planners are presently investigating the impacts of the dam situation to the Westerly area (Ref. 4,5).

Route I-95 provides good access to the area on both sides of the Pawcatuck River. Connecticut Routes 1 and 2, as well as the Westerly Bi-pass route 78, bring people directly to the area. A great percentage of people making use of the marinas are from the Hartford, CT; Springfield, MA and Holyoke, MA areas and make frequent use of these road systems. Amtrak runs along the Western end of the Bay with a station in Westerly, RI. A small airport is located nearby, east of the bay, also in Westerly, and is used by many boat owners renting anchorage space on the Pawcatuck River.

2.0 Harbor Uses

2.1 Industrial/Commercial

About 10 full-time and 10 part-time commercial fishing boats use the river for their anchorage. Maximum draft of fishing boats is about 6 to 8 ft. Current channel depths are adequate for these fishing operations. (Ref. 3)

2.2 Recreational

The river is presently used for small craft facilities of up to 55 ft, about 3/4 power and 1/4 sail. The trend, however, over recent years is toward more and larger sailing vessels requiring a minimum of a 6-ft draft (Ref. 3). Depths at the wharves range from 7 to 9 ft and can, in most cases, accommodate this larger trend, but the river channel is not deep enough.

Existing marina facilities on the both sides of the river are listed below (Ref. 6).

No.	Marina	# of Slips	# of Moorings	Maximum Size
1	Greenhaven Marina	60	12	40'
2	Miner's Boar Yard	---	---	---
3	Connors-O'Brien Marina	70	---	23'(power)
4	Riverside Marina	40	---	35'(power)
5	Pawcatuck R. Boatyard	16	---	35'(power)
6	Cardone Marine Service	70	---	35'(power)
7	Treb's Boat Yard	60	---	40'(power)
8	River Bend Boat Yard	24	---	35'(power)
9	Frank Hall Boatyard	110	25	45'
10	Covedge Bait & Tackle	10	---	23'(power)
11	Lotteryville Marina	80	15	35'(power)
12	Avondale Boatyard	96	25	55'
13	Watch Hill Boat Yard	45	30	35"
		681	87	

3.0 Projection of Harbor Activities

Fleet projections appear to be growing at about 10 percent per year. One marina operator reported that his operation has well more than doubled over the past seven years (Ref. 3). It was stressed, however, that for the boating industry to continue, dredging must be done.

Developable shorefront land is available along the river. High interest rates, however, have slowed down facility growth. Some of the marinas also have space to expand.

Channel users see the possiblity of making good use of dredged materials through containment structures and several sites were suggested (Ref. 3).

4

References

1 Little Narragansett Bay, Stonington, CT, Environmental Assessment, Sidecast Maintenance Dredging, Army CE, 1977.

2. U.S. Department of Commerce. United States Coast Pilot. Atlantic Coast: Cape Cod to Sandy Hook. 15th Edition, National Ocean Survey, Washington, D.C., January 1980.

3 Private Communication (J.Hall, Frank Hall Boatyard, Avondale, Westerly, R.I.), May 26, 1981.

4 Private Communication (G. Miller, Town Manager, Westerly), June 3, 1981.

5 Private Communcation (Joseph Brancato, Town official, Westerly), June 3, 1981.

6 Boating Almanac, Vol. 2, Boating Almanac Co, Inc., Severna Park, MD, 1981.

5

WATCH HILL COVE

1.0 Description

Watch Hill Cove is a small cove at the furthest southeastern corner of Little Narragansett Bay, in the township of Westerly, RI. It is basically a protected area, except during the fall season when it is exposed to the northwest wind. The mean tidal range is 2.6 ft at Pawcatuck Point. The buoyed dredged channel leading to the cove has a controlling depth of 7½ ft (9 ft at mid-channel), with wharf depths of 5½ to 10 ft inside the cove (Ref. 1). The 100-ft wide channel runs from the westerly end of the cove in a southeasterly direction to the Watch Hill Yacht Club pier, where it continues along in front of the piers on the easterly side of the cove northerly to the shore at the north end of the cove.

A major navigational problem concerns visual perception of boaters exiting the Watch Hill Cove heading north to the Little Narragansett Bay channel markers, where they must make use of the Bay Channel for access out into Long Island Sound. Marker N.18 is evidently not clearly visible from the Cove, thus boaters unfamiliar with the channel head directly for N.16 which is further to the left. This deviation off-course runs vessels over a bed of rocks with only about 2 ft of water clearance, resulting in grounding and boat damage. (Ref. 2)

Since the Watch Hill Cove is used primarily for residents of Watch Hill, the highway access for people coming into the area is not a primary concern for harbor activity.

2.0 Harbor Uses

2.1 Industrial/Commercial

There is no industrial activity in the Cove.

2.2 Recreational

The cove has a limited area of about 28 acres with wharf space for about 75 boats. A few slips are available for transient vessels, but due to overcrowding the area is used almost exclusively for Watch Hill residents. Vessels in the cove are mixed power and sail, up to 100 ft in length, with an average of about 30 ft (Ref, 2,3).

No.	Marina	# of Slips	# of Moorings	Maximum Size
1	Hob Yacht Sales	Unspecified		35'+(power)
2	Watch HIll Yacht Club			

3.0 Projection of Harbor Activities

The cove is presently used to capacity, and residents and town officials have no plans, at this time, to expand this harbor in order to accommodate more vessels. There is a great deal of shoaling in the the cove from littoral drift as well as wind-blown sand from off the beach. Maintenance dredging is required to control the shoaling. The cove was privately dredged this spring and the dredged sand was put back onto the beach. (Ref. 2)

References

1. U.S. Department of Commerce. United States Coast Pilot. Atlantic Coast: Cape Cod to Sandy Hook. 15th Edition, National Ocean Survey, Washington, D.C., January 1980.

2 Private Communication (J.Hall, Frank Hall Boatyard, Avondale, Westerly, R.I.), May 26, 1981.

3 Boating Almanac, Vol. 2, Boating Almanac Co, Inc., Severna Park, MD, 1981.

6

LITTLE NARRAGANSETT BAY

1.0 Description

Little Narragansett Bay is a rectangularly shaped harbor, about 2 miles long (North-South) and 1½ miles wide (East-West),(Ref. 1). It is bounded by Sandy Point, CT and Napatree Beach, RI to the south; Watch Hill, RI and the Pawcatuck River to the east; the Barn Island hunting grounds, CT to the north; and Ledwoods Island, CT to the west. Two rivers, the Wequetequock and the Pawcatuck, flow into the harbor from the north. It is a well-sheltered area in the lee of most summer winds, excellent for anchorage, which attracts primarily transient pleasure craft. The channel, with dredged sections, extends generally southeasterly across the bay to the mouth of the Pawcatuck River. In 1978, the controlling depth was 6 ft from the Sandy Point entrance to the Pawcatuck, except for shoaling in mid-channel opposite Lighted Buoy 3 (Ref. 2). The tidal range is 2.5 ft at Pawcatuck Point.

At present, there are two major navigational problems with the Little Narragansett Bay channel. At the east end, at the Pawcatuck River mouth, boats occasionally run aground on a rocky area. Those vessels headed North to the channel from Watch Hill Cove have a visual problem with the N.18 marker. This marker is evidently not clearly visible from the cove, thus boats head directly for N.16 further to the left, and run over a bed of rocks where the channel crosses in front of Pawcatuck Point. The second problem is that the breachway between Napatree and Sandy Points has developed a wider, more shallow flow area. Low tide depths have decreased 6 in to 1 ft over recent years. Tidal flow going through the breachway is flushing better, but boating usage is becoming more limited. Before the 1938 hurricane, Napatree and Sandy Point were connected. The tidal flow seems to indicate that nature is slowly rebuilding what it destroyed, and that perhaps eventually the two areas will once more be fully connected. (Ref. 3)

From the mainland the harbor can be reached from several different access roads leading off Route I-95, coming into the Stonington, CT area, the eastern Bank of the Pawcatuck River, and Watch Hill Cove. Amtrak runs along the Western end of the Bay with a station in Westerly, RI. A small airport is located nearby, also in Westerly.

2.0 Harbor Uses

2.1 Industrial/Commercial

About 10 full-time and 10 part-time commercial fishing boats use the Little Narragansett Bay Channel for access to Long Island Sound, from their anchorage on the Pawcatuck River. Maximum draft of the fishing boats is about 6 ft.

2.2 Recreational

Channel users mostly include recreational boats that have permanent/seasonal anchorage at a number of marinas along the river and boats getting in and out of Watch Hill Cove. The Little Narragansett Bay channel is the only route out into open water for boats on the river or in the cove. There are no marinas in the bay itself, which is used exclusively by transient pleasure craft, mixed power and sail, of up to 45 ft. On-season weekends can bring in 200 to 300 boats for overnight anchorage, with another 100 to 200 day boaters. The harbor's primary anchorage is located at the southeast area of the bay along the back (north) side of Napatree Beach.

3.0 Projection of Harbor Activities

Marina operators in adjacent areas see a trend toward larger sailing vessels with a 6-ft draft minimum. They see the future of the harbor dredging-dependent and that the boating industry would be severely affected if dredging were discontinued. Some marina and boat yard operators have secured 10-year permits and are already doing private dredging in order to meet the needs. (Ref. 3)

A future prospect for the channel is that it be moved so that it runs directly northwest to southeast across the bay, in order to bypass the rocky area off Pawcatuck Point. The bottom of the bay is primarily coarse to medium sand, thus users speculate that the channel could be moved with a minimum of effort with a great benefit to all channel users. (Ref. 3)

Town planners are just beginning to look into the dynamics of the harbor and, at present, do not have any formalized plans for the area. However, they see the use of land around the area as potentially changing in character due to increasing land values. (Ref. 4)

References

1 Little Narragansett Bay, Stonington, CT, Environmental Assessment, Sidecast Maintenance Dredging, Army CE, 1977.

2. U.S. Department of Commerce. United States Coast Pilot. Atlantic Coast: Cape Cod to Sandy Hook. 15th Edition, National Ocean Survey, Washington, D.C., January 1980.

3 Private Communication (J.Hall, Frank Hall Boatyard, Avondale, Westerly, R.I.), May 26, 1981.

4 Private Communication (G. Miller, Town Manager, Westerly), June 3, 1981.

STONINGTON HARBOR

1.0 Harbor Description

Stonington Harbor is located in the southeast corner of Connecticut in the town of Stonington, 3 miles northwestward of Watch Hill Point, RI. It is protected by breakwaters on both the east and west sides which are each marked by lights on their seaward ends. The controlling depth to the inner harbor is about 11 ft. Anchorage can be selected inside the west breakwater in depths of 15 to 18 ft. Vessels drawing up to 8 ft can find anchorage in the inner harbor. The town dock has depths of 7 to 12 ft alongside. The harbor is approached from southeastward and westward. The inner breakwater, about 400 yds northward of Stonington Point on the east side of the entrance, extends westward about 250 yds and is marked by a light. Following southerly weather, a surge is felt by vessels tied to the southern side of the seaward pier. (Ref. 1) The only dredged area of the harbor is at Penguin Shoals; this was done to permit access around the west breakwater for small boats (Ref. 2). There has been no dredging activity in the channel due to the harbor's adequate natural depths. The tidal range is 3 ft.

Silting around the Town Dock slip, caused by the tides and traffic, has created navigational problems for the fishing fleet. Some of the larger vessels must wait for the tide, and even then are limited as to docking access due to the filling in. (Ref. 3) Shoaling is on both sides of the pier and throughout the entire slip.

The Amtrak railway runs directly through the town of Stonington. Interstate Highway 95 and CT Routes 1 and 2 provide good road access to Stonington Harbor.

2.0 Harbor Uses

2.1 Industrial/Commercial

The only commercial activity in Stonington Harbor is a fishing fleet that consists of 34 vessels, of a maximum registered length of 72 ft (overall length about 82 ft). The fleet consists of 19 fishing boats and 15 lobster boats. Nine of the larger vessels are trip boats, going out for days at a time before returning to port; the others make day trips. The activity of the fishing fleet is year round. (Ref. 3)

2.2 Recreational

Stonington Harbor, which is a primarily recreational harbor, consists of vessels of mixed power and sail of a ratio of about 3/4 sailboats to 1/4 power. The average vessel is 25 ft with a maximum length of 62 ft for sail (with 11-ft drafts), and 82 ft for

power (with 9½ to 10-ft drafts). Marina space, both slips and moorings, are used to capacity (Ref. 2), and are listed below (Ref. 4).

No.	Marina	# of Slips	# of Moorings	Maximum Size
1	The Fisherman's Hideout	25		23' (power)
2	Don's Dock	80	2	23' (power)
3	Wadawanuck Yacht Club			
4	Dodson Boat Yard Inc.	30	100	35'+(sail)
5	Stonington Small Boat Assoc.			
6	Wayland's Wharf			
		135	102	

3.0 Projection of Harbor Acitivities

The fishing fleet is growing, and State and Federal financing is presently underway to improve the existing piers and facilities; the ice house will be doubling in size under Federal funding. (Ref. 2,3) Three new steel vessels have been added to the fleet over the past year; one 72-ft in registered length, the other two 67 ft. These boats, which draw 10½ ft, have limited access to the town dock, especially on the north side where, due to the silting problem, they can only dock at the end of the pier. On the south side of the pier there are also problems in turning around because of shallow areas. (Ref. 3) Harbor users feel that since so much effort is presently underway to improve the piers and waterfront facilities for the fishing fleet, depths around the dock need to be dredged to accommodate the effort.

The recreational trend is toward small sailboats because of the limited mooring space, the energy crunch, and financial burdens on both vessel and mooring (Ref. 2). Plans are in the beginning stages to survey and establish a management plan to grid the harbor in an effort to make maximum use of the mooring capacity. In addition, there is a present effort to stop any more commercial development of waterfront property for condominiums. This past development has taken up important waterfront access and has created limited use of the harbor to the public. The three public ramps have been lost to developers, and the harbor is now inaccessible to boaters without specified anchorage. (Ref. 2) Harbor officials hope that through future planning they will be able to make better use of the harbor for the benefit of recreational boaters as well as the fishing fleet.

Dredging is needed to make the dockages more accessible for the larger commercial fishing boats that now have to wait for the tide. However, the main channel is not considered to be a limitation to navigation at present due to the natural depths.

#7

References

1 U.S. Department of Commerce. United States Coast Pilot. Atlantic Coast: Cape Cod to Sandy Hook. 15th Edition, National Ocean Survey, Washington, D.C., January 1980.

2 Private Communication (Fred Fayal, Harbor Master, Stonington, CT), June 23, 1981.

3 Private Communication (Charles Chiappone, Waterfront Commission), June 23, 1981.

4 Boating Almanac, Vol. 2, Boating Almanac Co, Inc., Severna Park, MD, 1981.

MYSTIC RIVER

1.0 River and Harbor Description

Mystic River extends northward from Mystic Harbor, which is located in southeastern Connecticut, in the towns of Groton and Stonington, about 6 miles westward of Watch Hill Point, RI. The Harbor has a good natural channel that runs along Morgan Point on the west side of the harbor and extends north between Sixpenny Island and Mason Island, where the dredged channel begins (Ref. 1). Two dredged sections continue through Mystic Harbor north to the Marine Historical Association (Old Mystic Seaport) Wharf on the Mystic River, 0.6 mile north of the Route 1 bridge. In late fall of 1978, the mid-channel controlling depth was 11 ft to a point about 0.3 mile above the Route 1 bridge, then 7½ ft to the head of the Federal project. An anchorage area, with depths of 3½ to 7 ft, is in the lower part of the river between Willow Point and Murphy Point. Ice usually closes the river during January and February. The mean tidal range is 2.5 ft. (Ref. 2)

The channel was last dredged by the Corps in 1954, however it needs maintenance dredging to control the shoaling. Historically, the harbor's depths were greater with a broader expanse of water, but there has been a large amount of silting coming off the banks. The shoaling is a particularly severe problem in the river, where the buildup is greater. Marina operators say the problem is critical for the marinas and mooring areas on the river where the federally dredged mooring area is now half filled in (3). Many boats wanting to get up river to the Seaport area are large sailing vessels with 12 to 13-ft drafts. Operators of these boats are dependent on high tide to manuever their crafts up the narrow channel. The present channel width and depth, severely limit the number and size of vessels coming into the harbor. Discontinued dredging could curtail the economic stimulus of the area.

The town of Mystic is just off Interstate Route 95 and Route 1 passes directly through the center of town. A shoreline railroad (Amtrak), which is the main line from Boston to New York, also passes directly through the area with a stop at Mystic. Both the Railroad and Route 1 have drawbridges spanning the River with (non-raised) 4-ft clearances. Bridgetenders must be contacted to allow vessels requiring more clearance to pass through.

2.0 Harbor Uses

The Mystic River and Harbor are used by recreational craft, the local fishing fleet, and by transient craft (both private recreational and commercial) visiting Old Mystic Seaport.

2.1 Industrial/Commercial

The main industry on the harbor/river is recreational tourism, and most of the local commerce is supported by this industry. Commercial sailing vessels of 100 to 125 ft bring in visitors from New York. There is some fishing and lobstering but, for the most part, this industry is insignificant to the economy. (Ref. 4)

2.2 Recreational

The high influx of visitors come into the area by both road and water to enjoy the scenic attractions. The steamboat on the river carries about 55,000 people yearly. An estimated 3000 pleasure boats come into the Seaport Museum alone (Ref. 4). Two large schooners of up to 100 ft, one whaler, and a full-rigged training ship are permanently moored at the Seaport Museum on the river, and are available to the public. Along the waterfront of the museum property a mid-19th century coastal village has been recreated, with collections of maritime relics on exhibit.

Vessel types are a mix of about 2/3 sail and 1/3 power, and small excursion vessels use the harbor/river yearly. Heavy traffic is seasonal, mostly on the weekends. Most of the dock space is taken up by permanent/seasonal vessels. Most visitors use the Mystic Seaport's dock and the limited availability of the marinas. Marina dock space is used to capacity; there is no transcient anchorage area available that is easily accessible to shore from a dinghy, and no mooring space on the river for boats of 3-ft or greater draft. (Ref. 2,4,5)

No.	Marina	# of Slips	# of Moorings	Maximum Size
1	Mystic Shipyard Inc.	100		75' (sail)
2	Willow Point Marina	35		
3	Mystic Marine Railway	32		45' (power)
4	Groton Public Landing			
5	Fort Rachel Marine	60		35' (sail)
6	Old Mystic Marina	73		35' (power)
7	Mystic Seaport Museum			
8	Seaport Marine Inc.	55		35'+(power)
9	Whit-Mar Marina	200		45' (mixed)
10	Gwenmore Marina	90		35' (power)
11	Williams Cove Boat Yard	60		
12	Shaffer's Boat Livery		50	23' (power)
13	Brower's Cove Marina	65	50	23' (sail)
14	Mason Island Marina	91	40	
15	Mystic River Marina Inc.	200		60'+(power)
		1047+	140+	

3.0 Planned Future Activities

New larger sailing vessels are being designed, and the tourist trade is growing, making more demands on the area facilities. However, zoning regulations are restricting marina growth. Area planning indicates a desire of town officials for Mystic Harbor to be a recreational attraction for short-term visitors, and limit the area's permanent facilities. Dredging is vitally necessary to meet the traffic demands, as well as the demands of the unique types and sizes of sailing vessels coming into the area. (Ref. 1,4)

There is a proposed change of Amtrak location to move the tracks south of their present location. This move could leave unusable water frontage if not accomplished thoughtfully (2).

References

1 Private Communcation (Joseph Lewis, Harbor Master, Mystic Harbor, CT), June 1981

2 Private Communication (Wayne L. Burdick, Hellier Yackt Sales, Inc, West Mystic, CT), July 8, 1981.

3 U.S. Department of Commerce. United States Coast Pilot. Atlantic Coast: Cape Cod to Sandy Hook. 15th Edition, National Ocean Survey, Washington, D.C., January 1980.

4 Private Communication (Donald Robinson, Ship Yard Master, Old Mystic Seaport, CT), May 26, 1981

5 Boating Almanac, Vol. 2, Boating Almanac Co, Inc., Severna Park, MD, 1981.

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NEW LONDON HARBOR

1.0 Harbor Description

New London Harbor is located at the mouth of the Thames River in southeastern Connecticut. It is near the entrance of Long Island Sound into the Atlantic and has been described as "the most favorably endowed natural harbor," close to the North Atlantic sea-lanes. It is relatively free-flowing and non-sedimenting.(Ref. 1) The harbor is about four miles long and one mile wide. The western shore is characterized by small coves and a small harbor, namely, Shaw's Cove, Winthrop Cove and Greens Harbor; whereas the eastern shore is relatively straight. Piers, docks and wharfs jut into the harbor, especially at the northern end. The Gold Star Bridge (Route I-95) forms the northern boundary of the harbor. The topography on both sides of the harbor is characterized by gentle hills. Several rocky islands lie offshore on both sides of the harbor.

Shoreline land use is developed as industrial, commercial, institutional and residential.(Ref. 2) A major channel, 40-ft deep and 300-ft wide, extends the entire length of the harbor. The channel is widened at the State pier facility to accommodate submarines and a widened channel area serves the Naval Underwater Laboratory facility.(Ref. 3)

The port facilities provide 12 percent of Connecticut's waterborne commerce (Ref. 4). Vessels ranging from submarines, international steamers, Coast Guard cutters, tugs, recreational and fishing boats, and ferries ply the harbor waters. Forty-two wharves, piers and docks protrude into the harbor. The major imported commodities are petroleum activities. In addition, to anchorage space established within the harbor for large commercial/industrial/military vessels, special areas for small vessels are in Greens Harbor.

The town of New London and the city of Groton have populations of 30,400 and about 10,000 persons, respectively (Ref. 5,6). Employment opportunities are based primarily upon sea-related activities. The port is served by two major highways: I-95 which traverses the coastline and the Connecticut Turnpike which terminates near New London and extends north to Massachusetts.

No navigational problems were identified (Ref. 7).

2.0 Harbor Uses

2.1 Industrial

Several major industries are located near the harbor and receive commodities via piers, wharfs or docks, or otherwise utilize it. The major industries are as follows:

- o Electric Boat Division of General Dynamics.
- o Pfizer Co.
- o Thames Valley Steel Co.
- o Naval Underwater Laboratory.

Electric Boat manufactures, tests and launches submarines at their facility in Groton. The Pfizer Company produces pharmaceuticals and Thames Valley Steel ships steel assemblies by barge. The Naval Underwater Laboratory develops and tests special systems for sea uses. In addition, to those industries adjacent to the harbor, several others receive commodities via transfer from sea-going vessels to barges at New London. The Dow Chemical Company and Connecticut Power and Light utilize the harbor for entry to upriver points.

2.2 Commercial

Numerous commercial enterprises are dependent upon use of harbor facilities.

- o Hel-Cat Dock: Fishing - 1 Charter Boat plus supplies.
- o Whaling City Dredge & Dock: Towing service, marine construction
- o New London Muncipal Dock: Block Island and Fisher's Island Ferry, transients accommodated (fee)
- o State Pier Road Landing: 30-ft asphalt ramp

In addition to the above commercial enterprises, a number of marinas and marine suppliers depend on the harbor.

2.3 Institutional

The institutional uses of the harbor are listed below.

- o U.S. Coast Guard Station: Moorings
- o U.S. Coast Guard Buoy Depot: Moorings.
- o State Pier No. 1: Receipt and shipment of domestic and foreign commodities.
- o Anchorage near the State Pier: U.S. Navy submarines.

In addition to the above commercial enterprises, a number of marinas and marine suppliers depend on the harbor.

2.4 Recreation

The New London Harbor is used for charter boats, pleasure craft, sailboats, swimming, fishing and water skiing. The marinas within the harbor area are as follows (Ref. 8,9):

No.	Marina	# of Slips	# of Moorings	Maximum Size
1	Thames Yacht Club			
2	Marster's Dock	150	15	---
3	Burr's Yacht Haven	200		
4	A.W. Marina	20	10	35' (sail)
5	Fort Trumbull Marina	30		
6	Crocker's Boat Yard Inc.	250		35'+(power & sail)
7	Groton Dock	25		
8	Santacroce Marina	20		35' (power)
9	M.Costa & Sons	6		
10	On The Thames Motel-Boatel	16		
11	Submarine Memorial Assoc.	100*		
		817	25	

* Temporary tie up for transients, but application approved for 100 slips.

Additional mooring areas are near Greens Harbor. Several beaches are located near the entrance of the harbor. East Point in Groton is a town beach, Ocean Beach in New London is a town-owned beach, and Osprey Beach in New London is a private beach association facility.

3.0 Projection of Harbor Activities

The harbor activities will probably increase at a moderate rate (Ref. 10,11). The recreational use which is dependent in part upon the proximity to good sport fishing grounds should be fairly stable. Pleasure boating, swimming and water skiing will gradually increase. Several major increases are possible. The present increase in military spending could result in more submarine activity. If a commercial fishing industry is started in New London, it would result in an increase of port activity. If coal is off-loaded in the harbor, increased coal barge shipping activities could result.

Four small areas have been identified as potential port expansion sites:

	Site Description	Area (acres)	Remarks
1)	Beneath Gold Star Memorial Bridge, nor of the State Pier	9	Filling and bulkhead required
2)	New London mills site, a mile south of the State Pier	24	Headwall and filling require
3)	Winthrop Cove, between Central Vermont RR and Contrail tracks	7	Owned by the City of New London
4)	East Point in the City of Groton at the southern tip	50	Undeveloped wetland

The Goldstar Memorial Bridge site has been suggested as a regional and off-loading and rehandling facility, but there appears to be some local opposition to this (Ref. 6).

A containment site could well allow any proposed dredging activity to become more economically feasible, and two locations are considered.

1) Black Ledge, a rocky shoal off of Avery Point in Groton, has been recommended by the City of Groton Conservation Commission and Harbor Study Commission. Depths are 2 to 16 ft and the ledge is reported as a hazard to the navigation of recreational boats as well as having minimal value for fishing and lobstering. The island created by containment could possibly serve as a controlled ecological-educational studies facility, and ultimately would be developed as a nature preserve.

2) Two Tree Island, a small shoal about 1.4 miles northwest of Bartlett Reef Light and 0.7 mile southeast of Millstone Point in Niantic Bay, is roughly 3 miles away from New London Harbor. Both harbors could use this for containment. The site was recommended by the Connecticut Audobon Society for use after completion as a bird sanctuary. The site once supported a tern colony but now most of the island has washed away. Dike construction and filling to the 20 to 25-ft depth contours would provide for an island of from 20 to 50 acres in size. The most likely use is considered to be a wildlife habitat, but further study is required.

References

1 John J. McMullen Associates, Inc. An Inventory of Ports, Commercial Facilities and Commodity Movements on Long Island Sound. Prepared for The Eastern Region Ports and Intermodal Systems Office, Maritime Administration, U.S. Department of Commerce, New York, NY, June 25, 1975.

2 Zoning District Map, City of New London, T.E. Moore AIP, Dec. 1969.

3 Private Communication (Mr. David Ressitor, Connecticut Department of Transportation, Pier 1), May 27, 1971.

4 U.S. Department of the Army, Corps of Engineers. Waterborne Commerce of the United States, Calendar Year 1978, Part 1, Waterways and Harbors Atlantic Coast. U.S. Engineer Division, New England, Waltham, MA, 1978.

5 Register and Manual of Connecticut, Secretary of State, 1980.

6 Private Communcation (Groton City Hall), May 27, 1981.

7 Private Communication (Petty Officer Thurston, New London), June 17, 1981.

8 Connecticut Department of Commerce, Update of Corps of Engineeers Port Study, Task 3(a). Prepared for the Connecticut Department of Environmental Protection, Coastal Area Management Program, Hartford, CT, August 31, 1976.

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11 Private Communcation (Mr. Richard Erickson, Director Southeastern CT Regional Planning Agency, Norwich, CT), May 28, 1981.

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UPPER THAMES RIVER

1.0 River Description

New London Harbor occupies the lower 4 miles of the Thames River from the Connecticut Turnpike Bridge to Long Island Sound. The upper Thames River extends from this bridge about 12 miles to the City of Norwich (see attached map). The project dimensions for the main channel provide for a 33-foot channel up to the Groton Submarine Base about 2 miles north of the Turnpike Bridge on the eastern boundary (Ref. 1) and 25 ft deep, 25 ft wide to the upper end of Barlet Crossover then 200 ft wide to Norwich with increased width at bends, through Long Reach and at the head of navigation. The tidal range is 2.6 ft at New London and 3.1 ft at Norwich. Tidal currents following the general direction of the channel usually are not strong (Ref. 2).

The characteristics and commerce of New London and Groton are described in the monograph on New London Harbor. The third city on the river is Norwich, a small manufacturing city at the head of the Thames, having a population of about 38,000.

Navigational problems associated with ice in the winter and freshets in the spring occur. However, freshets seldom exceed 2 ft above high water at Norwich (Ref. 2).

Highways and rail lines flank both sides of the river (Ref. 1). Route 12 and the Central Vermont Railway connect Norwich with New London are on the west side while Route 2 and the Penn Central are located on the east side.

2.0 River Uses

2.1 Industrial/Commercial

The upper Thames River handled about 670,000 tons of waterborne commerce in 1978 (Ref. 3). Tonnage had grown during the early seventies and exceeded 1,000,000 tons in 1972-1974. A rapid subsequent decline resulted in less than 700,000 tons from 1976 onward. In 1978, of the 670,000 tons, 115,000 tons were basic chemicals and products and nearly all the rest consisted of residual fuel oil, distillate fuel oil and gasoline. In addition to the freight, nearly 50,000 passengers were carried on sightseeing boats.

There are six terminals north of the Connecticut Turnpike Bridge that are actively engaged in waterborne commerce (Ref. 1). Three facilities receive petroleum products for land distribution. In addition, there is a chemical plant, a sightseeing boat facility and a power generating plant. The Montville Station plant owned by Connecticut Light and Power is located about 5 miles north of the Connecticut

Turnpike Bridge. The plant with an installed capacity of 577,400 Kw has a net generation of about 2.4×10^9 Kwh.

Vessels most commonly accommodated have a draft of 17 ft and less but tankers with a draft of 22 ft use the lower part of the river (Ref. 3).

Unlike many ports of Long Island Sound, there is considerable amounts of developable land available on both sides of the river (Ref. 1).

2.2 Recreational

The recreational boat facilities of New London Harbor are listed in the New London Harbor monograph. Three facilities are available for recreational boating in the Upper Thames (Ref. 4). One facility will accommodate power boats up to 40 ft.

No.	Marina	# of Slips	# of Moorings	Maximum Size
1	Thayer's Marine	12		23' (power)
2	Gales Ferry Marina, Inc.	85		40' (power)
3	Long Cove Landing	60	10	10' (power)
		157	10	

3.0 Projected River Activities

Waterborne commerce on the Upper Thames is not likely to experience rapid changes. At the present time, there are no plans for the conversion of the Montville electric power plant from oil to coal (Ref. 5). Increased activity in pleasure boating and daytime sailing have been noted and may continue (Refs. 6 and 7). However, one Marina Operator close to Norwich noted the need for dredging to maintain even the current level of activity which is at capacity for that particular marina (Ref. 6).

References

1 John J. McMullen Associates, Inc. An Inventory of Ports, Commercial Facilities and Commodity Movements on Long Island Sound. Prepared for The Eastern Region Ports and Intermodal Systems Office, Maritime Administration, U.S. Department of Commerce, New York, NY. June 25, 1973.

2 U.S. Department of Commerce. United States Coast Pilot. Atlantic Coast: Cape cod to Sandy Hook 15th Edition. National Ocean Survey, Washington, DC. January 1980.

3 U.S. Department of the Army, Corps of Engineers. Waterborne Commerce of the United States, Calendar Year 1978, Part 1, Waterways and Harbors Atlantic Coast. U.S. Engineer Division, New England, Waltham, MA. 1978.

4 Boating Almanac, Vol. 2, Boating Almanac Co., Inc., Severna Park, MD. 1981.

5 Northeast Power Coordinating Council. Regional Reliability Council/ Long Range Coordinated Bulk Power Supply Programs. ERA-411, New York, NY, April 1, 1981.

6 Personal Communication (James Lewis, Owner/Operator, Gales Ferry Marina, Gales Ferry, CT), June 2, 1981.

7 Personal Communication (Robert Marsha, Dock Master Long Cove Landing, Gales Ferry, CT), June 3, 1981.

NIANTIC HARBOR

1.0 Harbor Description

Niantic Harbor is located just north of Niantic Bay, about 4.5 miles west of New London Harbor. The bay offers anchorage sheltered from all directions but south, in an average of 19 ft of water. At the east end of the bar, at the northern extreme of the bay, a narrow channel provides access to completely sheltered Niantic Harbor, and continues along the western side for another 1.7 miles to a point 300 yds northward of Smith Cove. In May, 1978, the controlling depth was 7 ft to the highway swing bridge .4 mile above the entrance, and 5 ft for the remainder.(Ref. 1) The Niantic River, above the channel, is still navigable for about another 1.5 miles to the village of East Lyme. The mean tidal range is 2.7 ft. (Ref. 1)

The primary navigational hazard centers around the two bridges that cross over the narrow harbor entrance. At the southeast end of the bar a bascule railroad span has a clearance of 11 ft, and a highway swing bridge .1 mile above has 9 ft of clearance. The narrow width causes a tidal current of 1.6 knots during flood, and .8 knot during ebb. Velocities may be much greater, however, during storms and freshets, and those unfamiliar with the entrance are advised to pass under the bridges at either slack water or against the current (Ref. 1).

Route 156 passes over the harbor entrance, and both the CT Turnpike and Route 1A pass about 2 miles from the harbor entrance, and come close to East Lyme.

2.0 Harbor Uses

2.1 Industrial/Commercial

There are no reported commercial vessel trips made in Niantic Harbor (Ref. 2). Party fishing boats are available, however, at the Mijoy Dock (Ref. 3).

2.2 Recreational

Virtually all harbor activity is recreational. There are 9 marinas and one yacht club (Ref. 3). Anchorage is presently used to capacity, and excess demand is available (Ref. 4,5). Mainly powerboats use the harbor's facilities, and the higher prices of fuel were not expected to encourage much interest in sailing vessels in the near future (Ref. 3,4,5). While the overall number of boats is expected to increase, no trend in size was cited. The average range in size is between 15 ft and 40 ft. Frequency of use is quite heavy in season, and there are indications that there may be even more day-boaters than ever before; even though some boats were believed to be purchased primarily as an investment (Ref. 4).

No.	Marina	# of Slips	# of Moorings	Maximum Size
1	Niantic River Marina	110	0	35' (power)
2	Boats, Inc.	120	0	25' (power)
3	Bayview Hotel and Marina	65	0	23' (power)
4	Darrow's Marina	80	0	35' (power)
5	Niantic boat Yard	40	25	---
6	Bayreuther Boat Yard	125	20	42' (sail)
7	Smith Cove Yacht Club			
8	Niantic Beach Marina	30	0	35' (power)
9	Waddy's Dock and Marina	66	0	35' (power)
10	Roland's Marine	20	0	35' (power)
		656+	45+	

3.0 Projection of Harbor Activities

Overall activity is increasing; however, shorefront land in the Niantic Harbor area is mostly unavailable for expansion of marine facilities (Ref. 4,5). There are development plans in Smith Cove, though, where present construction of floating docks may lead to a new marina (Ref. 5). Dredging was last done in 1976, and "is expected to be suitable for the next 15 years" (Ref. 5). A "no-action" scenario would only impact marinas over a relatively long time frame, and the smallest would be the most adversely impacted (Ref. 6).

References

1 U.S. Department of Commerce. United States Coast Pilot. Atlantic Coast: Cape Cod to Sandy Hook. 15th Edition. National Ocean Survey, Washington, D.C., January 1980.

2 U.S. Department of the Army, Corps of Engineers. Waterborne Commerce of the United States, Calendar Year 1978, Part 1, Waterways and Harbors Atlantic Coast. U.S. Engineer Division, New England, Waltham, MA, 1978.

3 Boating Almanac, Vol. 2, Boating Almanac Co., Inc., Severna Park, MD, 1981.

4 Private Communication (Craig Fischer, Boats, Inc.), June 2, 1981.

5 Private Communication (Sarah Bayreuther, Bayreuther Boat Yard), June 2, 1981.

6 Private Communication (Charlene Bergstrom, CT Marine Trade Association), June 10, 1981.

CONNECTICUT RIVER

1.0 Harbor Description

The Connecticut River, the largest New England river system, winds a navigable distance of 52 miles between Hartford and Long Island Sound (Ref. 1). The existing project calls for a channel 15 ft deep and 300 ft wide from the mouth of the river to the Lyme Railroad Bridge, and from there 15 ft deep and generally 150 ft wide to Hartford (see attached map). The tidal range varies from 3.5 ft at the mouth of the Connecticut River to 1 ft (at summer low stage) in Hartford.

The river water is fresh above Deep River. After the spring freshets each year, shoals with depths of 10 ft are found on bars in the upper river, necessitating dredging as soon as the river subsides (Ref. 2). Between Middletown and Hartford, the river flows through alluvial bottom land with the opportunity for shoaling from ice jams and freshets. Ebb current velocities of greater than 1 knot are observed under normal conditions on bars in the Connecticut River between Higganum and Hartford (Ref. 2).

Except for two population centers at Middletown and Hartford, the Connecticut River generally passes through rather sparsely populated countryside, consisting of farm land and rural residential areas.

Hartford is a center of insurance and finance with extensive and expanding office space for these and other service industries. Major divisions of United Technology and other defense-oriented companies are in the Hartford Area.

Problems to navigation result from the spring freshets at Hartford usually between 16 and 14 ft and also during the winter when, for about 2 months, the river is closed to navigation by wooden hull boats due to ice conditions. Each year after the spring freshets, shoals with least depths of 10 ft are found in places on bars in the upper river; dredging to remove such shoals is begun as soon as the water subsides (Ref. 2).

Major highway systems include I-91 on the west side of the river and Route 2 on the east side. Passenger and freight rail service from New Haven to Hartford and north is provided by Conrail and Amtrak. Several drawbridges and fixed bridges cross the Connecticut River between the entrance and Hartford, as do a few ferry services.

2.0 River Uses

2.1 Industrial/Commercial

In 1978 the Connecticut River below Hartford handled just less than 2.0 million tons of waterborne commerce (Ref. 3). This continues a steady decline in commerce since 1969 when over 4.3 million tons were handled. Only 83,000 tons were non-petroleum derived products (asphalt, tar, and pitches). The petroleum derived products are residual fuel oil (over 1. million tons), gasoline (500,000 tons), distillate fuel oil (257,000 tons), jet fuel (48,000 tons), and kerosene (8,000 tons). In addition to freight, over 100,000 passengers were carried in excursion boats.

Major industry includes three large aircraft engine plants, and three power generating plants, two of which are fossil fueled and one nuclear (Ref. 1). The two fossil steam plants are The South Meadow Plant in Hartford, owned by the Hartford Electric Light Company (HELCO), with an installed capacity of 216,750 Kw and a net generation of about 0.8×10^9 Kwh; the Middletown Plant, also owned by HELCO, with an installed capacity of 421,996 Kw and a net generation of about 2.5×10^9 Kwh. The nuclear steam plant, the Connecticut Yankee, located at Haddam Neck, is owned by Yankee Atomic Power and has an installed capacity of 600,300 Kw and a net generation of about 4.3×10^9 Kwh.

The major users of waterborne commerce are the HELCO plant at Middletown for residual fuel, the United Aircraft Plant and Bradley International Airport for jet fuel and petroleum distribution centers at Middletown, Portland, and East Hartford (Ref. 1).

There are 24 commercial facilities located along the Connecticut River between the Sound and Hartford. These are located in the Middletown-Portland and Hartford-Wethersfield areas. All terminals are confined to use of barges or small tankers of about 14 ft draft and less. They are summarized as follows: 13 are petroleum receiving facilities; two are car ferries; two are cement handling facilities; two handle coal tar; two are power plants; and three are plants of United Aircraft.

2.2 Recreational

At present, there are about 50 marinas, yacht clubs and boatyards on the Connecticut River from Long Island Sound to Hartford (Ref. 4). Most marinas contacted are presently at capacity and some reported plans to expand (Ref. 5 through 11). The following information summarizes the town information on pleasure boating facilities.

No.	Marina	# in Town	# of Slips	# of Moorings	Maximum Size
1	Old Saybrook	11	700	25	148'
2	Old Lyme	4	100	65	55'
3	Essex	8	320	100	190'
4	Hadddam/East Haddam	4	125		35'+(power)
5	Chester	7	950		35'+(power)
6	Deep River	2	150	13	
7	Lyme	1	10		35'+(power)
8	Portland	6	125	65	35'+(power)
9	Cobalt	1	20		
10	Wethersfield	2			
11	Glastonbury	3	110		35' (power)
	Totals	49	2610	268	

3.0 Projected River Activities

Waterborne commerce on the Connecticut River below Hartford has declined substantially during the seventies. It does not appear that waterborne commerce is likely to increase during the near-term. Population in central Connecticut is fairly stable and conservation efforts have held down increases in the demand for petroleum products. At present, it is not planned to convert the fossil steam electric generating plants in Hartford and Middletown from oil to coal (Ref. 12).

In some contrast, there is potential for increased recreational uses of the Connecticut River. Ample developable land is available along many stretches of the River. The improving water quality of the Connecticut River enhances the likelihood of using the water for recreational pursuits. Annual maintenance dredging is viewed as essential in many areas to maintain current levels of boating activities (Refs. 6,7,8,9,10).

References

1 John J. McMullen Associates, Inc. An Inventory of Parts, Commercial Facilities, and Commodity Movements on Long Island Sound. Prepared for The Eastern Region Ports and Intermodal Systems Office, Maritime Administration, U.S. Department of Commerce, New York, NY, June 25, 1973.

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6 Private Communication (Paul Barton, Owner, Hull Harbor One, Old Saybrook, CT), June 2, 1981.

7 Private Communication (Thomas Lambrecht, Dock Worker, New Terra Marina, Old Saybrook, CT), June 2, 1981.

8 Private Communication ((Paul Shepard, Owner, Essex Paint and Marine, Essex, CT), June 2, 1981.

9 Private Communication (Wallace Schieferdecker, Essex Island Marina, Essex, CT), June 3, 1981.

10 Private Communcation (Ronald Goidden, Ragged Rock Marina, Old Lyme, CT), June 2, 1981.

11 Private Communication (Thomas Haney, Partner, Ferry Point Marina, Old Lyme, CT), June 2, 1981.

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PATCHOQUE RIVER

1.0 Harbor Description

The Patchoque River extends for about 2 nautical miles from its source until it is joined from the west by the Menunketesuck River and empties into Duck Island Roads, 1/2 nautical mile due north of Duck Island, and 25 miles east of New Haven. A federally dredged channel extends .6 mile up the Patchoque River to a fixed highway bridge with a controlling depth of 6½ ft in 1977. (Ref. 1) The river is navigable at mean low water in any practical sense for only roughly .1 mi more above the bridge. The Menanketesuck River has a privately maintained channel with depths of 5 ft up to the fixed highway bridge through the channel is not marked in any fashion (Ref. 1).

Navigation is generally quite good (Ref. 2). Highway access is provided by Route 1, which passes over both rivers.

2.0 Harbor Uses

2.1 Industrial/Commercial

There are no commercial users other than small private fishermen. No commercial vessel trips have been reported (Ref. 3).

2.2 Recreational

Activity in both rivers is predominantly recreational. There are a total of twelve marinas and one yacht club in both rivers (Ref. 4).

No.	Marina	# of Slips	Maximum Size
1	Pilots Point Marina, North Yard	325	60' (both)
2	Menunketesuck Yacht Club		
3	Dick's Marina	70	23' (power)
4	Wetmore's Marina	145	23' (power)
5	Ol' Slat Harbor Marina	20	23' (power)
6	Westbrook Boat and Engine Company	30	23' (power)
7	Pier 76 Marina	250	
8	Patchoque River Marina	90	35'+ (sail)
9	Pilot's Point Marina, South Yard	325	60' (both)
10	Harry's Marine Report	25	35' (both)
11	Rocklittle Marine	26	35' (sail)
12	Calvin Yachts	12	35' (sail)
13	Westbrook Harbor Marina	80	35'+ (sail)
		1318+	

Anchorage capacity is mostly filled and there is no indication that demand will falter (Ref. 2). A mixture of power and sail utilize river facilities with no clear trend towards either type. In similar fashion, no change in boat size is expected (Ref. 2). The frequency of boat usage is quite heavy in season, and one marina even remains open on weekends after November (Ref. 4).

3.0 Projection of Harbor Activities

Developable shorefront land is quite scarce and expensive, and there are no plans for expansion of marinas or other development (Ref. 2). Dredging is not particularly felt to be needed, and a "no-action" scenario is not perceived to have serious impact for (an estimated) ten years (Ref. 2). Serious impact is considered to be a situation in which vesssel groundings threaten marine and associate business revenues.

References

1 U.S. Department of Commerce. United States Coast Pilot. Atlantic Coast: Cape Cod to Sandy Hook. 15th Edition. National Ocean Survey, Washington, D.C., January 1980.

2 Private Communication (Bill Passera, Pilot's Point Marina, North and South), June 3, 1981.

3 U.S. Department of the Army, Corps of Engineers. Waterborne Commerce of the United States, Calendar Year 1978, Part 1, Waterways and Harbors Atlantic Coast. U.S. Engineer Division, New England, Waltham, MA, 1978.

4 Boating Almanac, Vol. 2, Boating Almanac Co., Inc., Severna Park, MD, 1981.

CLINTON HARBOR

1.0 Harbor Description

Clinton Harbor is located at the mouth of Hammonasset River on the north shore of Long Island Sound, about 10 miles west of the Connecticut River and 20 miles east of New Haven Harbor. The inner harbor curves northwestward around the eastern end of Caslin Island to the main waterfront at Clinton (see map). The existing Federal channel, which extends from Wheeler Rock in the outer harbor to the town docks within the inner harbor, is to be widened from 100 ft to 150 ft.(Ref. 1) The depth will be increased from 4 ft to 8 ft mean low water (MLW) for the harbor (Ref. 2), and from 2 ft MLW in the Hamm River (Ref. 3). This channel is to be extended approximately 9700 ft through the inner harbor into the lower reaches of the Hammonasset River. Additionally, and 800 ft x 75 ft channel spur will be dredged to the mouth of the Indian River. (Ref. 1)

Population of Clinton is about 11,000. The town is reached primarily by automobile along one of the major coastal thoroughfares (Interstate 95). Freight is shipped by Conrail and numerous common carriers, although no major railroad spurs are adjacent to the harbor.

2.0 Harbor Uses

2.1 Industrial/Commercial

Principal industries are fishing and small boat building but the town's commerce depends heavily on water-based recreation activities during the summer months. There are no major industrial users of Clinton Harbor. There exists a small boat building industry which is most appropriately addressed under Recreation (below). Some commercial fishing is conducted out of the Harbor, with the largest vessel being about 45-ft long. There are 6 slips and 100 ft of dock space for fishermen (Ref. 4).

2.2 Recreation

Residential boating is the dominant activity in Clinton Harbor. Existing marina facilities are listed on the following page (Ref. 2).

Available water space in Clinton Harbor is estimated at 43 acres of which 37 acres is the inner harbor and 10 acres is located upstream on the Hammonasset River. Assuming recommended mix of boat types (i.e., 15% at 10 ft to 20 ft, 60% at 20 ft to 30 ft and 25% at 30 ft to 40 ft) and a planning factor of 30 boats per acre, the maximum capacity is estimated at 1290 slips. The estimated available excess capacity is 422 slips.

No.	Marina	# of Slips	Maximum Size
1	Hammonasset River Marina	70	-
2	Needle Loft	3	35' (Sail)
3	Yorkhaven Marina, Inc.	90	-
4	Riverside Basin	30	21'
5	Cedar Island Marina	400	90' (Sail)
6	Clinton Harbor Marina	130	35'+
7	Indian River Marina	30	23'
8	Old Harbor Marina	115	-
	Total Slips	868	

Available land exists for winter storage of the boats in Clinton Harbor. A 32 acre plot of vacant land has been marked for winter storage. At 950 ft^2 of required land storage space per boat this plot has an ultimate capacity of 1470 boats which slightly exceeds the harbor capacity. A mixture of power and sail exists, and a trend has been noted towards sailing craft (Ref. 5,6).

Conversations with marina operators and recent market surveys indicate that the facilities will be used to full capacity upon completion. The demand for boat slips in the area is such that there can be no doubt that all available slips would be rented (Ref. 1).

3.0 Projection of Harbor Activities

Harbor activities are expected to continue to center around the recreational boating fleet sheltered by Clinton Harbor. A dredging project is planned for the harbor as described in Section 1 above. It is expected that short-term development (within 2 to 7 years) will take place in response to completion of the dredging. Short-term development is estimated to be 350 additional slips (Ref. 1) which is most of the excess available capacity. No space is available, however, for adjacent land expansion unless marsh-construction restrictions are eased; though there is some acreage on Cedar Island that might be suitable (Ref. 7). Cedar Island Marina has, however, purchased adjacent marsh acreage with the intention of eventually expanding into a 1200 slip facility, and has even offered $80,000 toward channel dredging (Ref. 5).

The "pipeline" dredged material is proposed to be disposed in designated areas within Hammonasset State Park. The most probable use of lands created by disposal would be wildlife habitat and creation of marsh. A "no-action" scenario would eliminate any plans for expansion, and could significantly reduce boater traffic in the near future, which the town depends on, in part, for revenues (Ref. 5,7).

References

1 Flaharty-Giavara Associates, Economic Impact Evaluation, Clinton Harbor Improvements, May 1978.

2 Private Communication (Mr. Hadley, owner of the Holiday Dock), June 27, 1981.

3 U.S. Department of Commerce. United States Coast Pilot. Atlantic Coast: Cape Cod to Sandy Hook. 15th Edition, National Ocean Survey, Washington, D.C., January 1980.

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5 Private Communication (Mr. Rice, Cedar Island Marina), June 1, 1981.

6 Private Communication (Clinton Harbor Marina), June 2, 1981.

7 Private Communication (Chamber of Commerce), June 4, 1981.

GUILFORD HARBOR

1.0 Harbor Description

Guilford Harbor is located approximately 12 nautical miles east of New Haven Harbor. The harbor stretches from Mulberry Point in the east to Hogshead Point in the west, a distance of about 1.5 nautical miles across open water. Three rivers empty into Guilford Harbor: the East River and Sluice Creek east of Guilford Point, and the West River to the west of Guilford Point. A dredged channel originates about 0.5 mile northwestward of Half Acre Rock. The channel leads northward through the harbor and eastward of Guilford Point to a junction with Sluice Creek and East River, about 0.6 mile above the channel entrance. The channel continues northwesterly into Sluice Creek for about 0.1 mile and northeasterly into East River for about 0.4 mile to an anchorage basin. In 1978, the controlling depths in the dredged channel were 3.5 ft to the junction, 2.0 ft in Sluice Creek, and 3.0 ft in East River to the anchorage basin, and 2.0 ft in the basin itself. Limited navigation above the basin is possible. An overhead cable (clearance of 45 ft) is positioned 1 mile upstream as is a fixed railway bridge 0.3 mile north of the cable (clearance of 4 ft). (Ref. 1)

The approach to the harbor is obstructed by rocks and foul ground. The river is reported to bare at low water, and navigation in and out of the harbor and its marinas is limited. Tides play an important role as periods of low tide (water) severely restrict the number of hours per day in which vessels can venture into Long Island Sound. Besides being an inconveience, a serious grounding hazard exists to boaters not very familar with the area.

A railroad bridge (clearance 6 ft) crosses West River about 0.7 mile north of the mouth of the river. Above this location on the east bank lies the Town of Guilford which is linked to other coastal towns by railway and highway systems. The railway runs south of the town and north of the harbor, but plays no real role in harbor activities. Interstate 95 runs slightly to the north of the Town of Guilford, as does CT Route 1. Access to the harbor is accomplished by travel along secondary roads.

2.0 Harbor Uses

2.1 Industrial/Commercial

Several oyster boats along with several other fishing boats provide the total commercial activity of Guilford Harbor. In 1978, 33 tons of fresh fish and shellfish were brought in by 40 trips of vessels with drafts of 3 ft or less (Ref. 2).

2.2 Recreational

The Town of Guiford's waterfront access is almost exclusively used for recreational purposes. The marinas in the area provide anchorage space for the resident boat owners, and a limited amount of space for transients (Ref. 3).

No.	Marina	# of Slips	# of Moorings	Maximum Size
1	Brown's Boat Yard	25	0	38' (power)
2	Guilford Boat Yards, Inc.	15	0	35' (both)
3	Guilford Yacht Club			
4	Town of Guilford Marina	160	12	
		200	12	

Guilford's marinas are presently full and this can be attributed to the beauty of the town waterfront, its historic points of interest, and its restaurants, all of which attract boaters to Guilford. However, some boaters have left to seek harbors which can accommodate greater drafts and which also provide more on-shore boating facilities, such as gasoline and showers.

Guilford Harbor is utilized by both power and sailing vessels with the largest recreational craft being about 38 ft. Power boats make up somewhat more than 50 percent of the recreational fleet, although a trend towards increased use of sailboats appears to be occurring. This is possibly due to the increased costs of gasoline and diesel fuel (Ref. 5). The size of craft using Guilford Harbor are expected to get smaller, unless channel depths are deepened and maintained. This is contrary to the noticed shift towards the purchase of larger boats. However, the proposed dredging project in the harbor is expected to alleviate this problem.

Since many of the boats in Guilford Harbor are owned by the local residents, daily access to the boats is easy and this provides the opportunity for one-day excursions (Ref. 3,4,5,6).

3.0 Projection of Harbor Activities

Guilford's population is on the increase; this is expected to lead towards an increase in harbor activity as more residents become involved with boating. In 1974 approximately 1400 boats were registered in Guilford, and has climbed to around 2000 at present (Ref. 6). This will necessitate the need for an increase in marina capacities, and any increase in capacity is expected to occur on the West River at the site of the Guilford Yacht Club. Vacant land with access to the water presently exists in Guilford, but it is very expensive, zoned residential or marine recreational and does not lend itself to commercial or industrial activity. For this reason, Guilford Harbor is

expected to remain primarily recreation oriented. Other developable areas include tidal marshes, but because of Federal and state coastal development laws, and the local attitudes of the residents, they are expected to remain undeveloped.

A need for dredging exists in Guilford Harbor, and is expected to be fulfilled in the winter of 1981-82. Plans presently call for the removal of 70,000 to 80,000 c.y. of rather clean sand and silt. It will be hydraulically pumped to a site on the West River at the Guilford Yacht Club, a site previously used as a dump for privately dredged materials. Dewatering will take place behind earthened dams and the material will then be capped. The Guilford Yacht Club in the future is expected to develop the land for marine-related activities (Ref. 4).

Indications point toward a need for increased marina capacity and new and maintenance dredging both of which will preserve and increase the vitality of Guilford Harbor. If nothing is done to insure this a serious decrease in boating traffic is expected to occur, and marina and other closings are expected to follow.

References

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4 Private Communication (Bernard Lumbard, Marina Commission), June 5, 1981.

5 Private Communication (Dave North, Brown's Boat Yard), June 2, 1981.

6 Private Communication (Mr. Lowel, Town of Guilford Marina), June 1981.

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STONY CREEK

1.0 Harbor Description

The approach to Stony Creek lies behind the Thimble Islands, just under 3 nautical miles east of Branford, CT. A dredged channel starting due west of Flying Point, adjacent to Wheeler Island, extends about 350 yds to the village of Stony Creek at the head of the inlet. In 1976, the controlling depth was 4 ft in the channel and 2 ft in a turning basin found in the top 100 yds. A village dock, 400 yds north of Flying Point, on the east shore, has a reported depth of 4 ft just beyond it. (Ref. 1)

Once past the shallow areas surrounding the Thimble Islands, navigational hazards are minimal. Route 146 comes to within a little over 1/4 mile of the Creek, and an Amtrak station is found within the village. (Ref. 1)

2.0 Harbor Uses

2.1 Industrial/Commercial

Commercially the primary commodity is fresh fish, including shellfish of which 4 tons were brought in during 1978 by 14 trips of vessels under 3 ft in draft (Ref. 2). Recreational engine repairs can also be made (Ref. 3).

2.2 Recreational

There is one marina in Stony Creek with all its slips used to capacity (Ref. 3,4).

No.	Marina	# of Slips	Maximum Size
1	Stony Creek Village Dock	18	30'

Demand exists for increased capacity, but this is felt to be too expensive (Ref. 4). A mixture of sail and power is accommodated. There is a trend toward sailboats, with no change foreseen in boat sizes. Frequency of use is described as "heavy", and an increase is expected.

3.0 Projection of Harbor Activities

Overall activity in the Creek has been increasing (Ref. 4). There is developable shorefront land available, though it is too costly for municipal marine usage. (Ref. 3) The Stony Creek Public Dock plans to dredge its area privately this fall. A "no-action" scenario will have very little significant effect for quite some time, due to the limited volume of activity and generally acceptable present conditions.

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BRANFORD HARBOR

1.0 Harbor Description

Branford Harbor is located about 3 nautical miles east of New Haven, CT. The outer cove is located between Johnson Point to the west and Jeffrey Point to the east. South of two islands (the Mermaids), anchorage is available in at least 10 ft of water, though there is no protection from southern winds. The channel begins near the west shore about halfway back in the outer cove due east of Lover's Island, and extends northeast for about .9 mile with a controlling depth of 6½ ft in November 1978. (Ref. 1) The remainder of the channel has a controlling depth of 5½ ft to the head of navigation about 1.5 miles above Branford Point. (Ref. 1)

Shoaling to bare is found on both sides of the channel above Branford Point and 1/2 mile east a privately dredged channel with a depth of 4 ft can be found. Increased siltation over the past few years is attributed, to a large degree, to the severity of recent winter storms (Ref. 2).

Route 1 passes to within 1/4 nautical mile of some facilities, and the nearest turnpike exit is just over a mile away.

2.0 Harbor Uses

2.1 Industrial/Commercial

Aside from a traprock company that receives shipment by barge (Ref. 3), there is no reported commerce (Ref. 4), though a private marina owner reported that three lobster boats go out almost daily in season (Ref. 2). Complete recreational boat repairs are also available at two facilities that operate independently of any marinas (Ref. 5).

2.2 Recreational

Most boating activity in Branford Harbor is recreational. There are four marinas and one yacht club (Ref 5).

No.	Marina	# of Slips	# of Moorings	Maximum Size
1	Pier 66	350		55' (power)
2	Goodsell Point Marina	100	16	---
3	Dutch Wharf Boatyard	60		35'+ (sail)
4	Indian Neck Yacht Club			
5	Bruce and Johnson's Mar.	485		40' (both)
		995+	16+	

Anchorage capacity is filled (2,6), and there are even waiting lists for next season in early June (Ref. 2). Boat types are mixed and no clear indication of any trend was evident. The fuel situation would not seem to be dampening enthusiasm, however; in fact one boat dealer sold more powerboats this year than ever (Ref. 2). The average size of recreational crafts in Branford Harbor was not expected to change, and the frequency of use is quite likely to remain as at least two times a week, and more when an individual boater's time contraints make it possible (Ref. 2,6).

3.0 Projection of Harbor Activities

Activity in Branford Harbor has been increasing (Ref. 2,3,6). Between marsh land, private residential acreage, and present marine recreation, there is no available land and "any shorefront development will be residential or multi-housing" (Ref. 3).

While dredging of the channel would be beneficial to local interests, certain facilities have dredged their basins without waiting for the main channel to be done first (Ref. 2). Periodic dredging would prevent a slow loss of slips, and also create a more convenient situation for those boaters who would have to wait for near high tide to access the harbor. Still, a "no-action" scenario would not have a significant impact for some time since "Branford is not in dire need, unlike other harbors." (Ref. 3).

References

1 U.S. Department of Commerce. United States Coast Pilot. Atlantic Coast: Cape Cod to Sandy Hook. 15th Edition, National Ocean Survey, Washington, D.C., January 1980.

2 Private Communication (Mr. Williams, Owner, Pier 66), June 6, 1981.

3 Private Communication (Moss, Planning Administrator, Town of Branford), June 5, 1981.

4 U.S. Department of the Army, Corps of Engineers. Waterborne Commerce of the United States, Calendar Year 1978, Part 1, Waterways and Harbors, Atlantic Coast. U.S. Engineering Division, New England, Waltham, MA, 1978.

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6 Private Communication (Jane Kohler, Bruce & Johnson's Marina), June 2, 1981.

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NEW HAVEN HARBOR

1.0 Harbor Description

New Haven Harbor is located in south central Connecticut approximately midway between New York City and Providence, R.I. Three detached breakwaters protect the waters of New Haven Harbor from Long Island Sound. The main channel entrance to the harbor is between the East Breakwater and the Middle Breakwater and proceeds almost due north about four nautical miles to the head of the harbor where the Quinnipiac River and the Mill River share a common entrance point. The width of the harbor varies from about one-half mile near the head to about four miles near the breakwaters. A third river, the West River, empties into the northwestern portion of the harbor near City Point (see attached map). The controlling depths in feet at mean low water (MLW) for the main channel is 35 ft in the Entrance Channel, the Lighthouse Point Reach and the New Haven Reach. The controlling depth varies from 10 to 15 ft in the lower reaches of the Quinnipiac River and is 9 ft at the entrance to the Mill River (Ref. 1). More than 80 percent of New Haven Harbor is rather shallow with a depth of 20 ft or less.

New Haven Harbor is located in the south central Connecticut region which includes 36 cities and towns, the largest being the city of New Haven. The most significant natural resource in the region is the irregular coastline which provides many good beaches and sheltered coves for a variety of recreational activities such as fishing, swimming, water skiing, and pleasure boating (Ref. 2). Industrial and transportation characteristics of the region are also described in Ref. 2. In the Greater New Haven area, of the 100,000 non-government employees (1974 statistics), 77 percent are in manufacturing, 6 percent are employed by utilities, 3 percent by the railroad, 5 percent by hospitals, and 9 percent by colleges and universities.

The major highways serving the area are the Connecticut Turnpike (I-95) and U.S. Route 1 along the coast and Route 15 and I-91 that provide access inland to the north. Major rail service is along two routes--one between New York and Boston through New Haven, New London and Providence, and a second route from New Haven through Hartford and Springfield. A fixed highway bridge and a combination railroad and highway bridge are located at the confluence of the Quinnipiac and Mill Rivers; two highway bridges cross the Quinnipiac River; two fixed highways and one fixed railroad bridge cross the Mill River; and one fixed highway and one fixed railroad bridge cross the West River (Ref. 1).

The major navigational problem in New Haven Harbor is the lack of adequate channel dimensions and maneuvering area of sufficient depth to accommodate the larger vessels coming into general use in the petroleum trade (Ref. 2). The present distribution of vessels by deadweight tonnage (DWT) with channel depth of 35 ft is 20 DWT (10%), 30 DWT (50%), 40 DWT (35%), and 50 DWT (5%). In contrast the average DWT of oceangoing tank ships of 2,000 gross tons or more was 68,100 DWT at the end of 1975 for the world tank ship fleet. Often, if larger tankers can get into New Haven, they will lighten to reduce draft and take the remaining cargo/fuel to Bridgeport or Port Jefferson (Ref. 3).

2.0 Harbor Uses

2.1 Industrial-Commercial

New Haven Harbor handled 50 percent of Connecticut's waterborne commerce in 1977 (Ref. 4). Almost 80 percent of this was petroleum products. Half of the 17 million tons of petroleum products entering the state by water pass through New Haven Harbor; 2.3 million tons of general cargo are also handled through New Haven--a sizable portion is scrap metal which is exported worldwide. Other commodities include lumber, building cement, basic chemicals, and iron and steel sheets, plates, shapes pipes and tubes.

Waterfront facilities for deep-draft vessels are located along the north and east sides of the inner portion of New Haven Harbor (Ref. 1). Facilities for smaller vessels and barges are along the sides of the harbor and also in the Mill, Quinnipiac and West Rivers.

There are a total of 42 piers, wharfs and docks for New Haven Harbor; 38 are located in New Haven and 4 are in West Haven. The description of terminal facilities for the Harbor are given below. (Ref. 1)

Two of the waterfront facilities handle general cargo in the foreign and domestic trades, and one receives petroleum products and chemicals. Fifteen facilities receive and/or ship petroleum products; one receives sulphuric acid by barge; one receives bulk cement; two receive oysters and oyster shells. One facility is used for repairing small vessels; five for mooring fishing boats, small vessels, and floating equipment; and 17 were not used at the time of survey.

The New Haven Terminal, Inc., owns and operates the two waterfront facilities handling general cargo in foreign and domestic trades. North Dock, a wharf, provides 640 ft of berthing space with a water depth of 35 ft alongside at mean low water and is served by two, 30-ton, diesel-electric, traveling cranes. The New Haven Terminal South Pier is 80 ft wide and provides 700 ft of berthing space along each side with

water depths of 35 ft along the south side at mean low water. Three storage warehouses are at the rear of the pier; about 25 acres of open storage area is located at the terminal. Two surface tracks end at the pier and one surface track is on the wharf, all are connected with the Consolidated Rail Corporation.

Developable land is available in the inner portion of New Haven Harbor (Ref. 5). The United Illuminating Company owns more than 20 acres of open and vacant land immediately south of the existing New Haven Terminal. U.S. Steel owns about 34 acres on the east side of the Quinnipiac River north of Tomlinson Bridge which is potentially developable for port-related purposes such as storage. A third site is owned by ARCO/TAD Jones and is located immediately north of the existing New Haven Terminal scrap area, adjacent to the shoreline. The property consists of 22 acres and is presently a petroleum tank farm. It, however, would not be available for port development until about 20 years from the present.

The United Illuminating Company operates a fairly small electric generating plant powered by fossil steam located in New Haven. The English plant has an installed capacity of 146,250 Kw and has a net generation of about 500×10^6 Kwh.

2.2 Recreational

Recreational boating in New Haven Harbor is of secondary economic importance compared to commercial/industrial activities. The number of marinas and yacht clubs by town with appropriate information is given below (Ref. 6,7,8,9). A majority of the marinas are at full utilization. The most typical boats accommodated are power boats in the 24-35 ft range. Including the unspecified available anchorage at the yacht clubs, there are well over 1000 slips and moorings in the New Haven Harbor area, in about 43 acres of total anchorage space.

No.	Marina	# of Slips	# of Moorings	Maximum Size
1	West Haven Yacht Club			
2	Kimberly Harbor, Inc.	140		40' (power)
3	City Point Yacht Club			
4	City Point Boat Yard	24	6	
5	Trader's Dock	50		35'
6	Fair Haven Marina	50		
7	Waucoma Yacht Club			
8	M&S Industrial, Inc.	50		35' (power)
9	New Haven Marina	70		35' (power)
10	New Haven Yacht Club			
12	Lighthouse Marina, Inc.	50		23' (power)
		364	6	

3.0 Projection of Harbor Activities

The projections for the major activity of New Haven Harbor, petroleum trade, is for a decrease to about 9 million tons by 1990 followed by an increase to 10.6 million tons in 2000 (Ref. 2). Rapid increase of tonnage requirements are projected to 2030, but these are highly speculative depending on the continued availability of oil, degree of conversion of oil to coal, and gradual increase in the importance of renewable energy sources such as solar energy and wind energy.

At present, there are no plans for the conversion of the English electric generating plant from oil to coal (Ref. 10). However, it has been suggested that up to one million tons of coal per year could pass through New Haven Harbor and then by rail to plants in Mount Tom and West Springfield, MA, which are scheduled to be converted from oil to coal Ref. 11).

Port facilities development plans include the three potential sites that have been identified for the expansion of New Haven Terminal which has a current capacity utilization of 85 percent (Ref. 5). The sites have been discussed above. Additionally, a coastal development for navigation draft feasibility report has been published for New Haven Harbor (Ref. 2). A plan to improve the navigational characteristics of the harbor to accommodate large vessels carrying petroleum has been formulated. Under this plan, the main channel would be deepened to 42 ft and widened. The 105 acre turning basin would also be deepened to 42 ft and adjacent deep anchorage deepened to 30 ft over 18 acres.

However, regardless of exact tonnages, it is clear that demand for imported petroleum products will remain high in the next 20-30 years. A "no action" scenario regarding the navigational capabilities of New Haven Harbor would leave the projected vessel fleet composition (given in Section 2.0) in essentially the present breakdown. A no action scenario could require an increase in lightering operations but this method of supplying New Haven would be incapable of meeting with mid- or long-term needs (Ref. 2). Other potential solutions such as a storage center with deep water access or pipeline supplies from New Jersey pose a host of legal, financial and institutional problems. The vessel fleet composition serving New Haven could however be drastically changed by channel improvements and an incremental depth increase of +7 ft to 42 ft. It is estimated that the vessel fleet composition would then be 40 DWT (70%), 50 DWT (5%), 60 DWT (70%), 70 DWT (10%), and 80 DWT (10%). (Ref 2) This would enable New Haven Harbor to remain as a major center of marine commerce for petroleum products as vessel size continues to increase.

Recreational fleet size is projected to remain at current level (Ref. 12). Various shorefront development plans have been proposed; most recently for the Long Wharf

area for commercial fishing. Harbor activities are considered quite diverse and not all available land is suitable for development. Furthermore, local opposition is generally strong when proposals suggest conversion of vacant lands to marinas and commercial facilities (Ref. 12).

It is estimated that 7.2 million cubic yards of harbor bottom material would be removed to implement a 42-ft channel (Ref. 2). A containment structure in the Luddington Rock breakwater area provides a possible means for disposal of the dredged materials. A 200-acre area would result and offer the opportunity to relocate certain mainland harbor shorefront facilities and provide for new uses of the vacated shorefront land.

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MILFORD HARBOR

1.0 Harbor Description

Located 4 nautical miles east of Stratford Harbor, Milford Harbor consists of a widening of the Wepawaug River which pours into The Gulf. The Gulf affords anchorage in 6 to 15 ft of water, and is well protected but for south to southeastern winds (Ref. 1). About .4 mile out into The Gulf, a channel leads between Burns Point and Milford Harbor Light to a point .6 mile to end of navigation. The channel had a controlling depth of 10 ft with a width of 100 ft for about 1/2 mile, and 8 ft for .6 mile to the head of the channel and practical navigation. An anchorage basin with depths from 8 to 10 ft except for shoaling to 1 ft in the west portion is located about 250 yds above Burns Point on the west side. (Ref. 1,2) The mean tidal range is 6.6 ft.

While no bridges cross Milford Harbor, heavy siltation has been occurring in the upper half of the channel, with recent dreding by CE and local boatyards (Ref. 2,3).

Route 1 comes to within 1/4 mile of many harbor facilities and provides transportation access. The railway station is 3½ blocks from the city dock and two airports (New Haven and Bridgeport) are 10 miles from the harbor.

2.0 Harbor Uses

2.1 Industrial Commercial

Very few industries make use of Milford Harbor, though in 1978 a dry-cargo vessel, guided by a tugboat, both less than 11 ft in draft, carried in a load of 1116 tons of sand, gravel, and crushed rock (Ref. 4). Approximately 15 commercial fishermen bring in both fresh fish and shellfish (Ref. 2). About .2 mile above Burns Point, the U.S. Department of Commerce Division, the National Marine Fisheries Service, maintains a lab and research vessel to study shellfish. The State of Connecticut Aquaculture Lab is located adjacent to the federal lab are primarily concerned with the shellfish industry. (Ref. 2)

2.2 Recreational

Harbor activity is primarily recreational. There are four marinas and one yacht club (Ref. 5).

No.	Marina	# of Slips	Maximum Size
1	Milford Yacht Club	55	60'
2	Milford Port	150	50'
3	Milford Harbor Marina	250	40' (sail)
4	Milford Boat Works	99	40' (sail)
5	Spencer's Marina	150	
		804	

Many more boats are brought in by trailer when used; a total of 1720 vessels with at least an auxillary engine are on the 1980 Milford tax lists (Ref. 6). The marina anchorage basins are currently filled and "boat owners must wait for someone to die before slips become available."(Ref. 7) Storage space exists for over 500 boats. A mixture of power and sail is currently found, and there are inclinations towards sailing vessels (Ref. 3). However, length of vessels is not expected to shift too much. Frequency of usage has declined somewhat for middle-income families due to higher costs, especially fuel. The future trend also depends on whether the upper part of the channel is dredged since boaters are frustrated by grounding their vessels (Ref. 3).

3.0 Projection of Harbor Activity

Milford Harbor has been experiencing increased boating activity which is expected to continue Not much developable land is available along the shores; two parcels will soon have condominiums with private anchorage space for residents. (Ref. 3,7) While no new marinas have been proposed, a containment site is being considered that would extend the sand bar comprising The Gulf and create an outer harbor. Unless large quantities of dredged material are brought in from elsewhere, the land would have no other usage (Ref. 7). Maintenance dredging is considered essential for harbor vitality. A "no-action" scenario would allow the sedimentation caused primarily by beach erosion (Ref. 7) to decrease the boat size found at marinas, especially those over 30 ft (Ref. 3). Marina plans for anchorage area expansion are contingent upon maintenance dredging (Ref. 3); without such they would lose business.

References

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6 Private Communication (John Byers, Boating Division, CT Department of Motor Vehicles), June 15, 1981.

7 Private Communication (Bob Gregory, Executive Vice President, Milford Chamber of Commerce), June 4, 1981.

HOUSATONIC RIVER

1.0 Harbor Description

The Housatonic, the smallest of the Sound's navigable river systems, empties into Long Island Sound about 5 miles east of Bridgeport, Ct. (Ref. 1) The head of navigation for most purposes is at the towns of Derby and Shelton, about 12 miles above the entrance. It is navigable for commercial traffic for a distance of approximately 5 miles from the Sound. On the east side of the entrance to the Housatonic River, a breakwater extends southeastward with an inner arm of 3,250 ft and an outer arm of 2,571 ft. (Ref. 2)

The existing project for the Housatonic River provides for a 200-ft wide, 18-ft deep channel from the river mouth to Culver's Bar and then 7 ft deep and 100 ft wide to Derby and Shelton for a total length of about 12 miles. The mean tidal ranges are 6.7 ft at the mouth, 5.5 ft at Stratford, and 5 ft at Shelton. The river is joined by the non-navigable Naugatuck River in the vicinity of Derby. In 1971, it was reported that a shoal extended to the easterly edge of the main channel from Milford Point and that another shoal was extending into the channel from the northern end of Nells Island (Ref. 2). At the entrance to the Housatonic River, flood and ebb currents have a velocity of about 1.2 knots.

The land near the navigable part of the river is largely devoted to residential uses and manufacturing industries. Major highways include route I-95 which crosses the river about 4 miles from the Sound and Route 15 which is further inland. Passenger and freight rail service is provided by Conrail and Amtrak. Bridges include a highway bridge with a bascule span and a 32-ft clearance, located one mile above Stratford; 0.3 miles further up river is a fixed highway bridge with a clearance of 65 ft and a railroad bridge with a bascule span having a clearance of 19 ft; a fixed highway bridge is 3.7 miles above Stratford with a clearnace of 85 ft; and at Shelton there is a fixed highway bridge with a clearance of 30 ft. There are two fixed bridges above Shelton with clearances of 17 and 30 ft. (Ref. 2)

2.0 Harbor Uses

2.1 Industrial/Commercial

The Housatonic River handled about 475,000 tons of waterborne commerce in 1978 (Ref. 3). This is an increase from the low point of less than 400,000 tons in 1977. At the end of the sixties, waterborne commerce exceeded one million tons. In 1977, 420,000 of the 475,000 tons was residual fuel oil with the remainder being sand, gravel,

and crushed rock. The fuel oil is shipped to the Connecticut Light and Power Station at Devon. This utility has an installed capacity of 454,000 Kw and a net generation of 2.3×10^9 Kwh.

The two commercial facilities engaged in waterborne commerce are:

- o Connecticut Light and Power Station - located immediately north of the railroad bridge, which received residual fuel by barge for plant consumption; and
- o D.J. Carten Company Wharf - located about 1/2 mile north of the Power Station, which receives sand and gravel by barge.

2.2 Recreational

The Town of Stratford has 7 marinas, yacht clubs and boatyards located on the west bank of the Housatonic River. Additionally, a single marina is located in Devon on the east side of the river (Ref. 4).

No.	Marina	# of Slips	Maximum Size
1	Housatonic Marina, Inc.	105	23' (power)
2	Don's Marine Service		23' (power)
3	Housatonic Boat Club		
4	Brown's Boat Works	100	35'
5	Olsen Marine Co., Inc.		35'+(sail)
6	Stratford Marina	200	50'
7	Pootatuck Yacht Club		
8	Flagship Marina	100	23' (power)
		505+	

Many of the marinas are fully utilized (Ref. 5,6) and need to expand. About 500 slips, and over 50 moorings are available in an estimated area of 18 acres (Ref. 7). Facilities are available to accommodate 35 ft and larger sailboats but many of the marinas specialize in small (23 ft and under) power boats.

3.0 Projected Harbor Activities

It appears unlikely that commercial harbor activities will increase in the near future. A plan has been formulated by Northeast Utilities that calls for the conversion of the power plan in Devon to coal from oil by January, 1986 (Ref. 8). If this takes place, coal will replace oil as the principal commodity shipped into the Housatonic River and tonnage might increase. It has been estimated that about 0.6 million tons of coal per year may be shipped through the Housatonic River to the Devon plant (Ref. 9). In contrast to commercial activity, it seems likely that recreational boating would

increase in the future, provided that marina facilities can be expanded. At present, channel depths are not viewed as a constraint on recreational boating (Ref. 6), although local mooring basins are too shallow in several instances (Ref. 5,6). This expansion can occur provided that non-water uses of existing and potential sites for marinas do not predominate (examples are high rise apartments, condominiums, and office buildings on the waterfront).

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BRIDGEPORT HARBOR

1.0 Harbor Description

Bridgeport Harbor is located about 50 nautical miles northeast of New York City and 25 nautical miles southwest of New Haven, Connecticut. The Main Harbor includes the navigable portions of the Pequonnock River, the Yellow Mill Channel and Johnsons Creek (see attached map). These three tributaries empty into the Inner Harbor which is separated from the Outer Harbor by Tongue Point on the west and Pleasure Beach on the east. The entrance between the Inner and Outer Harbors is about three-eighths of a nautical mile wide. The Outer Harbor extends from this point three-quarters of a nautical mile south to converging breakwaters that protect the harbor from Long Island Sound. The Outer Harbor is also about three-quarters of a nautical mile wide. The main, dredged 35-foot channel extends northward from Long Island Sound to the Inner Harbor and thence northwestward to the mouth of the Pequonnock River. The mean tidal range in the harbor is 6.8 feet. With the exception of the channel and anchorage areas, most of the harbor consists of broad and shallow sand flats.

Approximately 90 percent of the land within the City of Bridgeport is developed (Ref. 1). Important basic industries in the area include manufacturing, trade and port-related activities. Major manufacturing, much of which is defense industry-related, includes firearms, brass goods, aluminum and zinc castings and valves, electronic appliances, wiring devices, aircraft and plastics (Ref. 1). The total area of the city is about 11,450 acres, of which water area comprises about 770 acres.

Bridgeport is well serviced by highway and rail transportation systems, with a spur running adjacent to the harbor. The extensive highway and roadway systems included Interstate 95 and State Highway 15 paralleling the coast, and State Highways 8 and 25 providing access inland. Passenger and freight rail service is provided by Conrail and Amtrak. Ten major bridges span the various waterways of Bridgeport (Ref. 2). Two fixed bridges for I-95 provide a 150 ft horizontal clearance and a 65 ft vertical clearance over Bridgeport Harbor connecting downtown Bridgeport with East Bridgeport, and a 100 ft horizontal and a 40 ft vertical clearance over Yellow Mill Channel at mean high water. Six bridges cross the Pequonnock River; the Stratford Avenue Bridge has a 7 ft clearance at mean high water which effectively eliminates any marinas for large boats in lower and upper reaches of the Pequonnock River. Yellow Mill Bridge over the lower reach of Yellow Mill Channel has an 11 ft vertical clearance at mean high water, restricting the middle and upper reaches to small boats (Ref. 2).

Considering the volume of waterborne commerce handled through Bridgeport Harbor, the harbor area is rather small, being less than one square mile. Bridgeport Harbor does have two anchorage areas inside the breakwaters; one with depths of 23 to 40 ft is on the east side of the main channel just northeast of Pleasure Beach, and the other with depths of 15 to 25 ft is at the west side of the channel near Tongue Point (see map) (Ref. 3). Similar to New Haven Harbor, a major navigational problem in Bridgeport Harbor is the lack of adequate channel dimensions and maneuvering area of sufficient depth to accommodate the larger vessels coming into general use in the petroleum trade. The current distribution of vessels by deadweight tonnage (DWT) with channel depth of 35 ft for Bridgeport Harbor (also with a main channel of 35 ft) is 20 DWT (10%), 30 DWT (50%), 40 DWT (35%) and 50 DWT (5%) (Ref. 4). In contrast, the average DWT of oceangoing tank ships of 2,000 gross tons or more was 68,100 DWT at the end of 1975 for the world tank ship fleet.

2.0 Harbor Uses

2.1 Industrial-Commercial

Bridgeport Harbor and Black Rock Harbor handled about 3.5 million tons (one-sixth) of Connecticut's waterborne commerce in 1977 (Ref. 5). Of this total, 80 percent, or 2.8 million tons, was petroleum products. Electric utilities in Bridgeport consumed about one-fourth of all petroleum products entering the port. Sand, crushed rock, and scrap are nonpetroleum products passing through the port.

A total of 21 piers, wharves and docks are located in the inner section of the Main Harbor and along the Yellow Mill Channel and the Pequonnock and Johnsons Rivers. The description of terminal facilities for Bridgeport Harbor is given below. (Ref. 3)

Three waterfront facilities are used for the receipt and/or shipment of petroleum products, one of these for bunkering vessels; two are used for the receipt of fuel oil for plant consumption; one for the shipment of scrap metal; and two are used for the receipt of sand, stone, lumber, steel products, pumice, marble and shipping containers in feeder barge service--one of these is also used for the shipment of scrap metal. One facility is a terminal for ferries operating between Bridgeport and Port Jefferson, Long Island, N.Y.; one is used for repairing small vessels; and eleven were not being used at the time of survey.

A privately-owed, common-user facility, the Cilco Terminal in Bridgeport Harbor, has been identified as a potential port expansion site (Ref. 6). The terminal is located on the east side of the Inner Harbor opposite Tongue Point. The terminal with a current capacity utilization of 88 percent has about 10 acres of open space and leases another 6 acres about a half mile away. Terminal expansion could be provided by bulkheading and filling in a water area between the existing terminal and the leased area.

On the whole, there is little land available for development along the Bridgeport harborfront, as much of the land, although underutilized, is committed to existing users (Ref. 6). Most of the land is devoted to non-water-dependent activities. The majority of shore frontage is used for industrial purposes. Water related uses such as marinas, parks, beaches, etc., are underdeveloped with generally inadequate facilities.

Two generating plants operated by the United Illuminating Corporation require a sizeable portion of available waterfront land. The Steel Point Plant has an installed capacity of 155,500 Kw and a net generation of about 635×10^6 Kwh; the Bridgeport Harbor Plant has an installed capacity of 660,542 Kw and a net generation of about $4{,}160 \times 10^6$ Kwh (Ref. 7).

2.2 Recreational

The City of Bridgeport has 13 marinas, yacht clubs and boat yards, of which eight are located within Bridgeport Harbor (Ref. 8,9,10). Over 1,000 slips are available with a reported area of 11 acres for the entire city (Ref. 11). It is estimated that less than half of these slips are in Bridgeport Harbor. There are long waiting lists for wet storage spaces at many existing marinas in Bridgeport (Ref. 7). Both power and sailboats of most sizes are accommodated in the marinas.

No.	Marina	# of Slips	Maximum Size
1	Hitchcock Gas Engine Co.	60	35'+
2	Pequonnock Yacht Club		
3	Riverside Marine	85	45' (sail)
4	Parsell's Marina	70	65'
5	Bill's Boat Basin	30	
6	Miamogue Yacht Club		
7	Speer's Boat Yard		35' (power)
8	East End Yacht Club		
		245	

In addition to the marinas and yacht clubs, the recreational uses of Bridgeport's shoreline include fishing piers, beach sites for swimming, parks for picnicking, etc.,

and water-oriented commercial centers (Ref. 7). However, while there are 466 acres of shoreline property with 4 miles of beachfront that is publicly owned, much is underdeveloped.

3.0 Projected Harbor Activities

A recent projection of Bridgeport Harborfront activities by NERBC emphasized the following three points (Ref. 6):

- o Increasing demands in recreational boating and commercial fishing will result in intense competition for limited mooring and docking space.
- o Due to expanding tourism, increased demand for commercial recreation will cause conflicts with existing industrial operations and local residential access to or use of limited waterfront land.
- o Nonwater-dependent industrial uses of the waterfront may be too costly to relocate inland during the next ten years, limiting waterfront property available for development.

Six alternatives have been considered for commercial navigation in Bridgeport Main Harbor (Ref. 1):

1) do nothing;
2) maintenance dredge main channel and turning basin only;
3) dredge existing 25-ft anchorage to 35 ft;
4) dredge existing 35-ft entrance channel and turning basin to 40 ft;
5) dredge area in front of Union Square Dock to 30 ft; and
6) dredge main channel, turning basin, and 25-ft anchorage to 40 ft; and dredge area in front of Union Square Dock to 30 ft.

Additionally, three alternatives were considered for the Pequonnock and Johnsons Rivers:

1) do nothing;
2) provide a 100-boat municipal marina in the Pequonnock River; and
3) provide a 6-ft deep 3-acre anchorage for recreational boats in the north spur of Johnsons River.

The upper reach of the Yellow Mill Channel has been identified as a possible site for dumping dredged material. It appears that the potential for industrial development of this land would be low because of the deteriorating characteristics of surrounding areas. One possible use could be low-rent housing (Ref. 12).

If a "do nothing" or "no action" scenario was adopted, commercial development of the Bridgeport Harbor area would be precluded and other supplemental means of supplying oil to the area such as lightering, transhipment, offshore terminals, or pipelines would have to be developed. In addition, the growth of recreational boating would be very much reduced and shoreline damage would likely continue. Analysis of the alternatives for commercial navigation suggest that only the combined improvement (Item 6 above) would be truly effective because of the need to accommodate very large vessels in the petroleum trade.

Consideration is currently being given to the conversion of the Bridgeport Harbor Electric Power Plant from oil to coal. This plant does have coal shoot facilities, and the back-up Steel Point Plant has coal storage areas (Ref. 10). While some increased tonnage could result from the oil to coal conversion, no significant problems are anticipated. It is estimated that between 0.75 and 1.0 million tons of coal might come into Bridgeport Harbor annually following conversion to coal (Ref. 13).

Port Facility Development Plans that have been proposed include the following: development of a civic center on the waterfront (Ref. 6); deepening the main ship channel; development of a large, multipurpose public marina on the coastal portion of Pleasure Beach facing Bridgeport Harbor (Ref. 5); and expansion of the privately-owned Cilco Terminal.

References

1 U.S. Army Corps of Engineers. Bridgeport Harbor and Vicinity, Bridgeport, Connecticut; Reconnaissance Report. U.S. Army Corps of Engineers, New England Division, Waltham, MA, April 1980.

2 Miller, George F. R. and R. J. Cable. Pleasure Boating in Bridgeport, Connecticut. Final Research Report. HECUS--The Urban Observatory, Bridgeport, CT, December 1977.

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6 New England River Basins Commission and Temple, Barker & Sloane, Inc. Roles for New England Ports (Tasks 4.2 and 4.3), Final Report. NERBC, Boston, MA, November 1980.

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9 Private Communication (Riverside Marina, Bridgeport, CT), June 4, 1981.

10 Private Communication (Parsells Marina, Bridgeport, CT), June 4, 1981.

11 Connecticut Department of Commerce. Marina Inventory, Task 3(b). Prepared for the Connecticut Department of Environmental Protection, Coastal Area Management Program, Hartford, CT, August 31, 1976.

12 Private Communcation (James Crispino, Director of Planning, City of Bridgeport, CT), June 12, 1981.

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BLACK ROCK HARBOR

1.0 Harbor Description

Black Rock Harbor is located about 50 nautical miles northeast of New York City and about 25 nautical miles southwest of New Haven. The entrance to the harbor is about two miles southwest of Bridgeport Harbor between Fayerweather Island and the mainland at Grover Hill. The main harbor is about three-quarters nautical mile long and one-half nautical mile wide at the entrance. Cedar Creek empties into the harbor head which is less than one-tenth of a mile wide. The creek extends northeast for about a mile and divides into short east and west branches, both of which terminate south of Interstate 95. Burr Creek extends a short distance northward from the harbor head. A channel 18 feet deep extends from Long Island Sound the full length of Black Rock Harbor forking into Burr Creek and Cedar Creek including its east and west branches. Apart from the dredged channel, the harbor and creeks are quite shallow being under 10 ft.

Approximately 90 percent of the land within the City of Bridgeport is developed (Ref. 1). Important basic industries in the area include manufacturing, trade and port-related activities. Major manufacturing, much of which is defense industry-related, includes firearms, brass goods, aluminum and zinc coatings and valves, electronic appliances, wiring devices, aircraft, and plastics (Ref. 1). The total area of the city is about 11,450 acres, of which water area comprises about 770 acres.

Bridgeport is well serviced by highway and rail transportation systems. The extensive highway and roadway systems include Interstate 95 and State Highway 15 paralleling the coast and State Highways 8 and 25 providing access inland. Passenger and freight rail service is provided by Conrail and Amtrak. Ten major bridges span the various waterways of Bridgeport (Ref. 2). All of these bridges, however, are constructed over Bridgeport Harbor and bodies of water emptying into this harbor.

The major navigational problem arises from the susceptibility of Black Rock Harbor to rough wave conditions during storms because of an absence of breakwaters at the harbor entrance (Ref. 1). The current 18-ft channel is barely adequate for barge delivery of oil. However, dredging the channel to 22 ft as proposed would allow safe passage for tugboats escorting the barges, and reduce the churning bottom silt and sediment. In addition to the above, current anchorage space and depth is inadequate to meet recreational boating needs. Plans have been proposed for the upgrading of the navigational capabilities of Black Rock Harbor which include:

1) construction of rock breakwaters at the entrance to Black Rock Harbor;
2) dredging the existing 18-ft channel to 22 ft;
3) dredging of additional anchorage at Black Rock Harbor entrance; and
4) dredging of authorized anchorage areas at Cedar and Burr Creeks.

2.0 Harbor Uses

2.1 Industrial/Commercial

Bridgeport Harbor and Black Rock Harbor handled about 3.5 million tons (one-sixth) of Connecticut's waterborne commerce in 1977 (Ref. 3). Of this total, 80 percent or 2.8 million tons was petroleum products. Electric utilities in Bridgeport consumed about one-fourth of all petroleum products entering the port. Sand, crushed rock, and scrap are non-petroleum products passing through the port.

A total of eight piers, wharves and docks are located in the Cedar Creek extension of Black Rock Harbor. The description of waterfront facilities given in (Ref. 4) is as follows:

One facility is used for the shipment of scrap metal; three are used for the receipt of petroleum products; one facility owned by Sikorsky Aircraft is used for the occasional receipt of helicopters to be repaired; and three were not being used at the time of the survey.

2.2 Recreational

The City of Bridgeport has 13 marinas, yacht clubs and boatyards of which five are located on the mainland shore of Black Rock Harbor, Burr Creek and Cedar Creek (Ref. 5). Over 1000 slips are available with a reported area of 11 acres for the entire city (Ref. 6). It is estimated that more than half of these slips are in Black Rock Harbor. There are long waiting lists for wet storage spaces at many existing marinas in Bridgeport (Ref. 7). Both powerboats and sailboats are accommodated in the marinas with the emphasis on powerboats of most sizes.

No.	Marina	# of Slips	Maximum Size
1	Black Rock Yacht Club		
2	Port 5 Naval Veterans Assoc.		
3	Fayerweather Yacht Club		
4	Fayerweather Boatyard		35'+(power)
5	CT Marine Services	280	35'+(power)
6	Cedar Boat Ways	175	35' (power)
		455	

The recreational uses of Bridgeport's shoreline include: 1) marinas, 2) fishing piers, 3) beach sites for swimming, 4) parks for picnicking, etc., and 5) water-oriented commercial centers (Re. 7). However, while there are 466 acres of shoreline property with four miles of beachfront that is publicly owned, much is underdeveloped.

3.0 Projection of Harbor Activities

The fuel oil terminals in the upper reaches and head of Cedar Creek currently supply about 60 fuel oil distributors with home heating oil (Ref. 1). A large percentage of homes and small businesses in the Greater Bridgeport area are supplied by these distributors. The deliveries required to keep the terminals supplied have been increasing and are expected to increase further in the future. This expectation prompted the harbormaster to suggest deepening the existing channel to 22 ft to allow for safe passage of tugs and barges.

The potential for the expansion of recreational boating may be affected by two constraints (Ref. 1). Municipally-owned land on the north shore of Burr Creek is designated a Free Trade Zone by the City of Bridgeport. To implement the zone, a sizeable navigational channel may be required through Burr Creek. This would reduce the possibility for future recreational boat anchorage, and increased commercial traffic on the waterway may reduce recreational activity.

A second constraint relates to the Connecticut Resources Recovery Plant on Cedar Creek northeast of the Free Trade Zone. Barge traffic related to by-products of the plant might inhibit recreational boating in Black Rock Harbor. However, at present it is uncertain as to when the plant will become operational.

It is considered likely that a do-nothing or no-action alternative (i.e., no breakwater, no deepening of channel and no creation or improvement of anchorage areas) would have a significant adverse effect on the development of recreational boating and increase the difficulty of maintaining the current method and volume of oil supply to the Bridgeport area. A rock breakwater at the mouth of the harbor is required to protect the existing and prospective recreational fleet and stimulate the creation of additional anchorage areas in Black Rock Harbor. The deeper channel will facilitate the safe accommodation of oil barge traffic increases.

A proposed fill extension site for dredged material is the area just to the west of the sea wall and Barnum Blvd, extending south to Fayerweather Island. It is considered that the most likely use of this fill would be recreational with the development of marinas a distinct possibility (Ref. 8). It is anticipated that the current dump site behind the sea wall might eventually be used as a site for apartments. Once the Resource Recovery Plant is operational, use of this dump site is

to discontinue. The development of recreational facilities in Black Rock Harbor will be much more likely with the construction of a proposed breakwater. However, the construction of the breakwater is subject to uncertainty since a significant portion of the financing of the project must come from the city of Bridgeport because of the recreational nature of the benefits to be accrued.

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2 Miller, George F. R. and R. J. Cable. Pleasure-Boating in Bridgeport, Connecticut. Final Research Report. HECUS--The Bridgeport Urban Observatory, Bridgeport, CT, December 1977.

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SOUTHPORT HARBOR

1.0 Harbor Description

Southport Harbor is located almost one mile west of Pine Creek and a mile and a half from the primary residential portion of Fairfield, CT. Sasco Hill Beach lines the eastern entrance shore. At the mouth, the wide bay narrows to about 200 ft; the channel width is 100 ft wide and two-fifths of a mile long. The channel, last dredged in 1959, had a mid-channel controlling depth of 6½ ft in March 1978 for 1½ miles to the end of the harbor basin, then the mean low water level is 3½ ft in the anchorage area above the 2/5 of a mile point inward (Ref. 1). The Mill River enters from above, but its flow is regulated by a dam one-eighth mile below Route 1, such that it adds little effect to the mean tidal range of 7 ft. There are oyster stakes located southeast of the harbor entrance, as well as many 6-ft mean low water spots at the actual entrance (Ref. 2). There is also a high spot in the middle of the channel that will ground a 6-ft draft vessel at mid-tide (Ref. 3).

Amtrak rails pass over the Mill River just above Route 1. The nearest highway exit from the Connecticut Turnpike is about one-half a mile away.

2.0 Harbor Uses

2.1 Industrial/Commercial

While no industry makes use of Southport Harbor, there are town-owned fishing boats that go out daily for oyster and lobsters. The maximum boat length is rather small and only roughly 20 pots are set (Ref. 2). A 35-ft marine railway is available at the town-dock to facilitate engine and hull repairs.

2.2 Recreational

There is currently a town dock offering 65 dinghies for daily rental, and one yacht club. The Pequot Yacht Club has 86 moorings this season, which are filled to capacity. Although excess demand does exist as recreational boating is becoming more popular in the Southport area (Ref. 3), there are no known plans for yacht club expansion in the near future. There is, however, a desire to place 100 moorings at the town dock, since it is estimated that $10 million dollars worth of boats are within a reasonable radius (Ref. 2,4,5). The availability of these spaces depends on the willingness of the Army Corps of Engineers in conjunction with local interests to dredge the area. Virtually all the craft are sailboats, with the largest having a length of 45 ft and a draft of nearly 8 ft. No significant change in average boat size is foreseen.

No.	Marina	# of Slips	# of Moorings	Maximum Size
1	Southport Town Dock	0	100	35'
2	Pequot Yacht Club	16	75	48'

Frequency of use seems to be predominated by day sailors; most of the remainder are businessmen who go out on weekends.

3.0 Projection of Harbor Activities

The overall activity in the harbor is increasing, with fuel prices having little effect upon sailboats. Most of the shorefront real estate is residential. The Town of Southport could develop a large tract on the eastern side except that it is currently under a 200-year lease as a golf course (Ref. 3). As stated in Section 2.2, the current development plans, consisting of an additional 100 moorings, are contingent upon dredging operations which, in turn, require local financial support. A "no-action" scenario, for whatever reasons, would not be serious in the near term. Although such an alternative would effectively prevent any benefits of expansion, no serious difficulties other than increasing inconvenience would accrue until after roughly five years. At that point, significant financial problems would result at the yacht club.

References

1 U.S. Department of Commerce. United States Coast Pilot. Atlantic Coast: Cape Cod to Sandy Hook. 15th Edition, National Ocean Survey, Washington, D.C., January 1980.

2 Private Communcation (Mr. Claude Johnson, Southport Harbor Master), June 4, 1981.

3 Private Communcation (Pequot Yacht Club), June 1, 1981.

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SAUGATUCK RIVER AND WESTPORT HARBOR

1.0 Harbor Description

The navigable portion of the Saugatuck River in Connecticut is 3.9 miles in length, extending southward from the town of Westport, CT to Long Island Sound. The river mouth is 2.5 miles below Saugatuck between Cedar Point on the east, and Bluff Point on the west. From there the Stram River, with a reported depth in the narrow, twisting channel of 6 ft to Stony Point just below Saugatuck, and 3 ft above (in 1971), deepens to a mean low tide depth of approximately 8 ft in Westport Harbor. The mean tidal range is 7 ft. Freshets do not significantly affect the water height. (Ref. 1)

A 3-ft deep shoal at the entrance to Duck Creek, on the west ban presents a navigational hazard, especially since the channel runs along this side.

A highway swing bridge with a clearance of 6 ft crosses the river 1.4 miles down-river from Westport; a three-hour advance notice is required to operate it (Ref. 2,3). The Connecticut Turnpike crosses a tenth of a mile below, and another tenth of a mile down a bascule span railroad bridge utilized by Amtrak crosses the river. The railroad bridge has a clearance of 13 ft and the railroad passes through the village of Saugatuck. (Ref. 1)

2.0 Harbor Uses

2.1 Industrial/Commercial

There is currently one lobster fishing outfit in the Saugatuck River, located on the west bank just below Bridge Street (Rt. 136). The firm has 27 boats with drafts ranging from 4 ft to 6 ft. One vessel, a dragger, with 5½-ft draft, will attempt to accelerate to 14 knots over certain sand bars, yet attains only 4 knots of speed. The owner felt that his enterprise has considerable excess demand and would significantly expand except for the siltation problem (Ref. 4). The only other establishment that is equipped to utilize the river is L.H. Gault and Sons, importers of 285,000 gallons of oil every two weeks as well as some sand and gravel. Until April, 1980, this company ran both barges and a tanker in the channel--each loaded such that a limiting depth of 9'6" was achieved. The boats would dock at high tide and then wait for the next to head back out. This was discontinued in April, yet would certainly resume if the obstructions were ridden from the channel. (Ref. 5) Their land storage area totalled .917 acres.

2.2 Recreational

There are four marinas and three yacht clubs in Westport Harbor and the Saugatuck River. The specified facilities are as follows (3,4,5,6)

No.	Marina	# of Slips	# of Moorings	Maximum Size
1	Saugatuck H. Yacht Club	140	0	80'
2	Coastwise Marine Corp	20	0	23' (power)
3	Ford's Riverside Marine	40	15	23' (power)
4	Cedar Point Yacht Club	130	0	50'
5	Compo Basin *	47	183	36'
6	Minuteman Yacht Club	(uses municipal facilities)		
7	Longshore Strait Marina*	157	0	36'
		534	198	

Anchorage space is used to capacity during the boating season which runs from May to November. The Westport Recreation Department, which operates the two municipal marinas (* above), report that there is an estimated need to double the current available moorings (Ref. 7,8). The blend between power and sail is fairly homogeneous, with an approximate ratio of two-thirds sailboats and one-third power. There seems to be a slight trend towards sailboats as well as a movement towards larger boats in general (Ref. 8). The maximum size boat commonly accommodated is 36 ft, with more vessels in the 37-45' range being seen. This points to a future need for deeper water to match the larger draft as sailboats with fixed keels require more room and depth than powerboats, and larger sailboats only exacerbate the situation.

The State of Connecticut has just completed a two-lane launching ramps on the east side of the Saugatuck River just above the railroad bridge.

3.0 Projection of Harbor Activities

The bulk of the activity in the past five years in the Saugatuck River and Westport Harbor has been recreational, and this has been increasing. More and more residents in the area are discovering the pleasures of boating, perhaps indicating a rise in regional affluence. At one municipal marina the waiting list for mooring space is four years long (Ref. 6). The town of Westport just purchased 3½ acres of land for possible marine use along the west shore, one mile above Bridge Street (Rt. 136). A proposed three million dollar expansion of both municipal marinas was defeated at Referendum (Ref. 3,9). If the town developes the site above Bridge Street, it will have to cater to smaller (under 30 ft) draft due to the low overhead clearance of the swing bridge which would make the increase in the number of boats far less than the

area should be getting (Ref. 2). With the exception of Gorham Island, which is 78 percent wetland, there are no other significant development sites for buildings along the waterfront.

A "no-action scenario" with regard to dredging would result in a gradual problem. The area above Bridge Street would be expected to fill in first since it is less susceptible to flushing by the tide, and marinas in this region would eventually fold. Even much further downstream, at the Longshore Strait Marina, maintenance dredging must be performed every three years or else the silt will cause grounding of smaller craft at high tide. (Ref. 3,8) The new boat bill which levies a State fee in lieu of local property taxes is expected to cause an influx of roughly 15,000 new boat registrations into Connecticut. How many of these boats are already kept in Connecticut is hard to say. At any rate, this legislation will lead to more large boats in Westport. Therefore, pressure to maintain the dredged channel would be expected to increase.

A town-owned landfill site at Hendricks Point is undergoing a state-ordered closure. The 20 or so acres are rocky, sheltered from wave action, and available as a containment site. The amount of bulkheading required is unknown since the site was used for sanitary landfill and is unstable (Ref. 3). The degree of municipal cooperation that could be elicited is unknown. It would be advisable to contact Mr. Nunhall, executive officer of the Westport Chamber of Commerce, for further information if any interest becomes warranted.(Ref. 2) Use for dredged material was rejected by the CT DEP since water would leach back into the estuary (Ref. 3).

References

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2 Private Communication (Mr. Nunhall, Chief Executive of the Westport Chamber of Commerce), June 4, 1981.

3 Private Communication (Joe Schacter, Concrete Flotation), July 15, 1981.

4 Private Communication (Mr. Robathan, Robathan Lobster Co.), June 12, 1981.

5 Private Communication (Mr. Gault, L.H. Gault & Sons), June 12, 1981.

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7 Private Communication (Day Manager, Compo Yacht Basin), June 1, 1981.

8 Private Communication (Day Manager, E.R. Strait Marina), June 1, 1981.

9 Private Communcation (Mr. Miner, Westport Town Planner), June 4, 1981.

NORWALK HARBOR

1.0 Harbor Description

Norwalk Harbor is located in Connecticut about 40 miles east of New York City. It is about half a mile wide at the entrance of Calf Pasture Point and extends about three quarters of a mile to point of entrance of the Norwalk River. A dredged channel extends three miles northeasterly from Sheffield Island Harbor between Manresa Island and White Rock to the first highway bridge at South Norwalk (Ref. 1). The channel continues northerly for another 1.3 miles to the basin at the head of navigation at Norwalk. The project depths for the main channel are about 12 ft from the Outer Harbor to the Washington Street Bridge and thence 10 ft deep at the basin at the head of navigation at Norwalk. The tidal range is about 7 ft. (Ref. 1)

Three bridges cross Norwalk River between South Norwalk and Norwalk (Ref. 1). The highway bascule bridge at South Norwalk has a clearance of 8 ft, and a railroad swing bridge just north of the highway bridge has a clearance of 16 ft. These bridges have bridgetenders available to assist boaters with access up the river, although passage is limited during peak highway traffic periods. These bridges are a major navigational hindrance since 85 percent of goods shipped to Norwalk Harbor are off-loaded north of the bridges (Ref. 2). A turnpike highway bridge for I-95 above the railroad bridge has a clearance of 60 ft.

The population of the City of Norwalk is about 77,700. Norwalk and surrounding area can be considered part of New York's suburbs. It was once heavily manufacturing oriented but is changing to service industries (Ref. 3).

Norwalk is well serviced by highway and transportation systems which include Interstate 95 and State Highway 15 paralleling the coast and State Highway 7 providing access inland. Passenger and freight rail service is provided by Conrail. Water transportation is Norwalk's second most important transport mode (29.8%), surpassed only by truck transport (56.5%) (Ref. 2).

2.0 Harbor Uses

2.1 Industrial/Commercial

Norwalk Harbor handled 823,000 tons (3.7%) of Connecticut's waterborne commerce in 1977 (Ref. 4). Of this total 770,000 tons (95%) were petroleum products. Over half of the total tonnage is received by the Norwalk Harbor Power Plant (Ref. 3). The total tonnage in 1978 increased slightly to 851,000 tons.

A total of nine facilities are actively engaged in waterborne commerce (Ref. 3). These facilities include one power generating station; one oyster handling facility, three sand and gravel handling facilities, and four petroleum products handling facilities.

Most vessels accommodated were oil barges with a draft of 6 ft and less (70%). Vessels with a draft in excess of 16 ft were rare (0.5%) (Ref. 5). Siltation of the channel is cited as a cause of navigation problems. As a result, only partially loaded vessels, usually 70 percent filled, could enter the port. This problem has been alleviated to some degree due to recent dredging of the main channel (Ref. 2).

An electric generating plant operated by the Connecticut Light and Power Company is located at Keyser Point on Manresa Island, about a mile from the harbor entrance. The plant has an installed capacity of 338,000 kw and a net generation of about 2×10^6 Kwh. Petroleum fuel stock for the power plant is off-loaded to an underwater pipeline out in the Sound.

Sand and gravel storage requires extensive land areas situated on-shore to facilitate loading and unloading. Currently, four areas are dedicated to sand and gravel, and expansion of these is limited by existing land use.

2.2 Recreational

The City of Norwalk (including South Norwalk and East Norwalk) has a sizable number of marinas, yacht clubs and boatyards which enable Norwalk Harbor to be a major center for pleasure boating (Ref. 6,7).

No.	Marina	# of Slips	# of Moorings	Maximum Size
1	S. Norwalk Boat Club	20	0	28'
2	Vinco Marine Service	100	0	43' (sail)
3	Rex Marine Center, Inc	70	0	50' (power)
4	Ischoda Yacht Club			
5	Maurice Marine	6	0	
6	Norwest Marine, Inc.	100	0	50' (power)
7	Shore Points Marina	60	0	35' (power)
8	Neptune Boat Club	80	0	35' (power)
9	Veterans Park Launching Ramp			six lanes
10	East Norwalk Boat Club			
11	Pastime Boat Club			
12	Overton's Outboard Serv.	15	15	23' (power)
13	Shore & Country Club	110	0	50'
14	T.J. Marina, Inc.	60	25	
15	Bloom Bros. Marine	100	15	23' (power)
16	Norwalk Boat Club	40	0	30'
17	Norwalk Cove Marina	450	0	70'
		1281+	55+	

About 1,800 slips are available with about 370 moorings in a reported area of 36 acres. Many marinas are at full utilization and report a need to expand (Ref. 8,9,10). Powerboats and sailboats of all sizes are accommodated.

It should be noted that in recent years a few marinas have been eliminated or reduced in size to accommodate condominums (Ref. 11).

3.0 Project of Harbor Activities

Harbor activities, especially those of a recreational nature may be expected to increase. The outlook for waterborne commerce which constitutes a fairly minor portion of harbor activity is less certain. The potential conversion from oil to coal of the Norwalk Harbor Generating Plant on Manresa Island, if realized, will impact on the type of commerce and tonnage in the future. It has been estimated that about 0.9 million tons of coal will pass through Norwalk Harbor annually following conversion to coal (Ref. 12). A proposed schedule for conversion suggests 1985 as the target date (Ref. 13). If the conversion takes place, there is the possibility for the development of a major tank facility on Manresa Island (Ref. 11).

One study of the potential effects of oil and coal conversion suggests that due to the barge traffic and storage requirements, the following could result 1) chronic spills of coal in the harbor, 2) rain water washing off coal into the harbor, and 3) spills associated with increased tugboat traffic. (Ref. 14)

Potential shoreland developments include two proposed condominum complexes and a municipal marine-related museum (Ref. 11).

References

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14 Pellegrino, Peter, E., An Evaluation of Potential Effects of Coal Transportation and Storage on the Ecology of Norwalk Harbor. Connecticut Coastal Energy Impact Program (Submitted to the City of Norwalk Health Department, Nov. 1980).

WILSON POINT HARBOR

1.0 Harbor Description

Wilson Point Harbor is found to the north of Sheffield Island Harbor between Bell Island on the west and Wilson Point on the east in Connecticut between Stamford and Norwalk. The outer portion of the Harbor can easily anchor a 6-ft draft vessel in many places. At one time oil was received at a pier near Wilson Point where the average depth at low tide is naturally 11 ft. There is a privately dredged channel 3' deep leading to a very sheltered inlet approximately three-quarters of the way around the harbor from Bell Island or 0.6 miles northwest of Wilson Point (Ref. 1). This channel is currently being dredged to 6 ft and will allow boats to leave without waiting for near high tide.

A silt runoff problem does exist at the entrance of the channel that requires special attention. Other shoaling presents less of a hazard to navigation, primarily near marina facilities. Local roads provide good transportation access, with the CT Turnpike over 2 miles away.

2.0 Harbor Uses

2.1 Industrial/Commercial

There are no industrial or commercial shipping establishments in the Harbor.

2.2 Recreational

Two yacht clubs and one marina are located in Wilson Point Harbor. Capacity of these facilities are given below (Ref. 2,3).

No.	Marina	# of Slips	# of Moorings	Maximum Size
1	Wilson Cove Boat Yard	100		40' (sail)
2	Wilson Cove Yacht Club	Uses Wilson Cove Boat Yard Facilities		
3	Norwalk Yacht Club		180	50' (sail)

The existing anchorage space is currently used completely, though no plans for expansion now exist.

Sailboats far outnumber powerboats in the harbor. There has been no real switch from powerboats to sailboats, though, as the few powerboat owners adamantly stay with their favorite mode of water recreation despite higher prices for gasoline. A more formidable obstacle is the fact that the gas dock at Norwalk Yacht Club can only be reached when the water is above mid-tide (Ref. 2).

There is an observable trend towards larger sailboats, especially those with fixed keels (Ref. 2). These boats typically require at least a 6-ft draft, and before the current dredging long waits would be an effect of such an occurrence. Widely differing statements were found concerning frequency of boat usage. The range was from daily usage to waiting for a special two-three week tour. The point of unison seemed to be that at whatever frequency, even sailboat owners stayed more in the local area (Ref. 4). The reason for this is not clear.

3.0 Projection of Harbor Activities

Recreational boating has been steadily increasing over the past forty years in Wilson Point Harbor (2). The effect of higher fuel costs is apparently not changing this trend, though if a long term increase continues, this could very well result in stabilizing or declining powerboat usage. There is little room for expansion outwards at any marine facilities in Wilson Point Harbor, and there is currently almost no available land. With the exception of the marina and yacht clubs, all the land is utilized for private housing and only four homes have even a possibility for subdivision. There are currently no plans for development of port facilities. Since the channel is privately dredged, it would seem that as long as the marine establishments are able to continue maintenance dredging at roughly a five-year interval that a "no-action scenario" would not have any adverse effects.

References

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4. Private Communication (Ms. Linda Reed, Coastal Area Management and Planning), June 1, 1981.

FIVE MILE RIVER

1.0 Harbor Description

Five Mile River is located 0.6 miles east of Bell Island in Rowayton, Connecticut. The mean range of the tide is approximately 7 feet. Dredging ended March 1973, creating a controlling depth of 7 ft from Red Nun #4 inwards for 0.8 miles. The depth of this 50-ft wide channel then declines to 3 feet for another 150 yards. Above this, the river is not considered navigable. In 1974, there were two locations (41° 03' 21" N, 73° 26' 51" W; and 41° 02' 22" N, 73°26' 48" W) where the mean low tide depth was 5 ft (Ref. 1). Currently a few more such spots exist (Ref. 2). A special anchorage area skirts the river's shore on both sides up to the Route 136 bridge, with the Harbor Superintendent appointed by the Five Mile River Commission determining moorings permitted and degree of extension, if any, into the federal channel. This area is currently subjected to shoaling both near the west bank mouth at Butler's Island and along the eastern bank. At some points, though not in the channel, there is no water at the river mouth at low tide.

2.0 Harbor Uses

2.1 Industrial/Commerical

While no industry using water transport is located near the Five Mile River, five establishments exist that perform engine and hull repairs. They typically service boats that frequent Five Mile River marinas and usually are affiliated with them. There are also 8 lobster fishermen, although the maximum vessel draft does not exceed 4½ ft (Ref. 2). The lobster boats are usually out daily in season.

2.2 Recreational

There are six marinas, all located along the east bank. The facilities are listed on the following page (Ref. 4). This anchorage space is used to capacity, and there are even estimates that the region could currently treble the number of moorings and slips, and remain full (Ref. 3).

The second largest marina in Five Mile River, Rowayton Marine Works, has conducted a survey concerning frequency of boat usage over the past few years. The results indicate that 25 percent of boat owners use their boats three times/week, 25 percent two times/week, and 25 percent every day in season (Ref. 3). The remainder either use their boats infrequently or wait to take longer trips. The per capita use factor has increased in leaps and bounds, and is expected to continue to worsen, creating traffic snarls.

No.	Marina	# of Slips	# of Moorings	Maximum Size
1	White Bridge Marina	31		
2	W. Robert Haskell	30		
3	Rowayton Marine Works	85	55	
4	Village Marine			
5	The Bait Shop	20		23' (power)
6	The Boatworks	52	6	
		218	61	

The channel is just marginally able to handle the current extent of this trend towards large sailboats, and certain marinas suggest they soon will be forced to pull out moorings if they are unable to secure dredging permits that allow removal of the mud flats along the edge. Such mud flats are valuable in the local food chain and absorb toxic metals, creating an environmental controversy. Also, such dredging is generally considered needed every five years as compared to 10 years for a channel (Ref. 5).

3.0 Projection of Harbor Activities

No one contacted felt that the higher fuel prices would affect activity, especially since this river accommodates many sailboats. Due to the increasing activity, however, dredging was felt to be needed to keep pace--in some places moorings have already been placed encroaching the federal channel in violation of navigational regulations (Ref. 6). As has been apparent at Darien town meetings, however, residents along the west shore are opposed to the dredging of any location due to a feeling that the equipment is too noisy and disruptive. An investigation is desired of the costs and benefits of various dredging means, especially pipeline dredging. Another constraint is the availability of shorefront land.

There is virtually no vacant land, and the last sale of developed property was by the Colewater Seafood Co., which made way for an office complex. This was completed in 1980. There is concern that even if the marinas do not fold in the next five or so years due to increased general shoaling, the "no-action scenario," that they will be virtually forced by lucrative prices into providing the space for new apartment houses and office buildings. The Five Mile River Commission is currently working on the local initiation of a Marine-Commercial Zoning category, already existing in Old Saybrook, Essex and Greenwich, which would preserve the marina institution to a much greater degree while not being so inflexible as to prohibit the building of an office area on a marina's land to supplement income from boat storage in the winter. Even with enactment of this category, however, the marinas would face a slow strangula

tion, beginning in all likelihood with the inability to hold fixed-keel vessels unless dredging occurs. (Ref. 2,3,6)

References

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2. Private Communication (Dave Sinclair, Chairman, Five Mile River Commission), June 8, 1981.

3. Private Communication (Mr. Hartog, Rowayton Marine Works), May 29, 1981.

4 Boating Almanac, Vol. 2, Boating Almanac Co, Inc., Severna Park, MD, 1981.

5. Private Communication (Ms. Linda Reed, Coastal Area Management and Planning), June 3, 1981.

6. Private Communication (Mr. Don Relier, Harbor Master and Operator of the Boatworks), June 1, 1981.

WESTCOTT COVE

1.0 Harbor Description

Westcott Cove is found roughly 1/2 mile east of Stamford Harbor, just west of Cove Harbor, in Connecticut. Depths in the basin leading to the channel are about 8 ft. The water in the channel had a controlling depth of 7 ft to Buoy #9 in 1976, then 5 ft for 300 yds in 1978, followed by shoaling to bare (Ref. 1). A sand bar extends from West Beach out just into the channel, and there has been an increasing silting problem due to storms from the south, causing navigational problems at low tide (Ref. 2). The range of the tide is 7.2 feet.

2.0 Harbor Uses

2.1 Industrial/Commercial

There is no industrial or commercial shipping enterprise in Westcott Cove.

2.2 Recreational

There are two marinas and one yacht club located in the Cove. The specified facilities are as follows (Ref. 3,4)

No.	Marina	# of Slips	# of Moorings
1	Dock Services, Inc.	55	
2	Halloween Yacht Club		
3	Cummings Park Marina		

Currently anchorage space is not being used to capacity, nor is there any anticipation of this occurring in the near future. Mainly sailboats use the Cove, with the largest fixed-keel vessel being "moored" in outwater, measuring 65 ft. A trend toward larger sailboats has been thwarted due to the amount of time that one must wait until such large boats can set out, and the hours within which they can return. A favorite pastime among marina operators on weekends is watching boats hang up in the channel and perhaps even tilt over if the tide is lowering (Ref. 4). Despite this, most sailing is done from Friday to Monday, with little foreseeable change likely in this pattern.

3.0 Projection of Harbor Activities

While the overall growth rate for marine activities in Westcott Cove has not been impressive, the increased effect of fuel costs would seem to be minimized by the

preponderance of sailing craft (Ref. 5). A more likely explanation for the relatively steady-state is that the small size of the cove attracts only local residents. There are no known plans for expansion of port facilities; even an increase in boating demand would fail to elicit a response due to the status of developable land. The only commercially zoned sites along the shorefront are where there currently are marinas--and this is quite unlikely to change (Ref. 6).

A "no-action" scenario would, for this reason, affect only current operations, probably severely curtailing the use of even medium size vessels in approximately ten years. Whether in the interim there would be a switch towards more shallow-draft boats (such as power boats or smaller sailboats) or simply more patience allotted in waiting for nearly high tide would depend on the attitude of the individual boaters, and the influence via their position that marina operators could exert.

References

1 U.S. Department of Commerce. United States Coast Pilot. Atlantic Coast: Cape Cod to Sandy Hook. 15th Edition, National Ocean Survey, Washington, D.C., January 1980.

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3 Boating Almanac, Vol. 2, Boating Almanac Co, Inc., Severna Park, MD, 1981.

4 Private Communication (Dock Services), May 29, 1981.

5 Private Communcaiton (John Sheridan, Stamford Harbor Master), June 4, 1981.

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STAMFORD HARBOR

1.0 Harbor Description

Stamford Harbor is located at the mouth of the Rippowam River in southwestern Connecticut about 30 miles east of New York City. Two detached breakwaters, the eastern one extending from Shippan Point, protect the harbor from Long Island Sound. The harbor is entered between the breakwater through the main dredged 18-ft channel that leads northward about one mile to an East Branch and a West Branch. The project depth is 18 ft in the entrance channel to the north end of the 18-ft anchorage; 15 ft in the remainder of the entrance channel, the West Branch and basin; and 12 ft in the East Branch at mean low water (Ref. 1). The harbor is more than a mile wide at the breakwaters and narrows to about half a mile at the branching point. Controlling depths varied (in June 1975) from 11 ft (14 ft at mid-channel) in the entrance channel to the junction with East and West Branches; 12 ft (15 ft at mid-channel) in the West Branch to the turning basin at the head; and 7 to 12 ft in the basin (Ref. 2). In August to November 1978, the mid-channel controlling depth in the East Branch was only 4 ft, but this has recently been dredged to the 12-ft project level (Ref. 3). In general, currents in the harbor have little velocity and the tidal range is just over 7 ft.

Stamford is a manufacturing city of about 103,000 people located on the peninsula at the head of the harbor. The economy of the region is strongly influenced by its proximity to the New York City metropolitan area. The industry of the surrounding area about Stamford is rapidly changing from a manufacturing to a service orientation (Ref. 4).

Stamford is served by two major east-west highways, the Merritt Parkway about 4 miles inland and Interstate 95 which passes through downtown just north of the East Branch and over the Rippowam River just before it empties into the East Branch. State Highway 7, a few miles to the east in Norwalk, provides major access inland to the north to Danbury. Passenger and freight rail service is provided by Conrail and Amtrak. Spur tracks from the railroad service facilities are on the East Branch.

Dangers to navigation (Ref. 2) include a cluster of rocks, referred to as the Cows, about 0.8 miles to the south-southeast of Shippan Point, which are almost bare at low tide. Between the Cows and Shippan Point is an area of foul ground and bare rocks that extend 0.4 miles south of Shippan Point; a lighted bell buoy is located about 0.2 miles south of the Cows. Harbor Ledge, about 200 yards south of the west breakwater, consists of rocks and a ledge marked by a private light. Anchorage areas with depths of 13 to 17 ft are located just north of the breakwaters. Small craft can anchor in the vicinity of the Stamford Yacht Club.

2.0 Harbor Uses

2.1 Industrial/Commerical

In 1977, Stamford Harbor handled 783,000 short tons or 3.5 percent of Connecticut's waterborne commerce. About 65 percent of this was petroleum products and the remaining 35 percent consisted mainly of sand, gravel, crushed rock and scrap (Ref. 5). Tonnage increased significantly in 1978 to over 1,000,000 short tons, again achieving levels of the Sixties and early Seventies (Ref. 1).

A total of nine active wharves and piers are located on the East and West Branches of Stamford Harbor (Ref. 4). Five facilities are used for the receipt of petroleum products; one is used to ship scrap metal and three are used for the receipt of sand and gravel. All are barge facilities. Nearly all vessels entering and leaving Stamford Harbor have a 14 ft or less draft (Ref. 1).

The Hartford Electric Light Company operated a small fossil-fuel steam generating plant in Stamford. The plant with a net generation of less than 60 x 10^6 Kwh in 1972 was retired in that year. This plant currently is excess property and could be considered a candidate for development (Ref. 6).

2.2 Recreational

The City of Stamford has 11 marinas, yacht clubs and boatyards. About 1,900 slips are available with an estimated area of 38 acres available (Ref. 7,8). Many of the marinas are at full utilization and report a need to expand. Facilities are available to accommodate 35-ft and larger powerboats and sailboats. (Ref. 8,9,10,11) In recent years some marinas in the region have been replaced or reduced in size or capabilities by the development of condominums (Ref. 6), but a bulkhead for a new city-owned marina is in place on the East Branch (Ref. 3).

No.	Marina	# of Slips	Maximum Size
1	Yacht Haven West	310	35'+
2	Southfield Park & Marina	Residents Only	
3	Yacht Haven East	365	120'
4	Ponus Yacht Club	80	40'
5	Stamford Yacht Club		
		755+	

3.0 Projected Harbor Activities

Harbor activities may gradually increase. With the recent maintenance dredging on the East Branch, navigation problems are minimized. Certainly there are a number of uncertainties. Nearly half of all the land in the South End (area between East and West Branches) including much of the water frontage is controlled by just five owners

(Ref. 11). The future of several large properties is currently uncertain. There is strong demand for conversion of marine-related lands to condominiums and office space. Marinas are viewed as not economical uses of land (Ref. 12) There is currently no marina/commerical zone in Stamford.

A plan for civic and community initiatives for Stamford's South End has been prepared for the Stamford Economic Assistance Corporation (Ref. 11). South End consists of approximately 350 acres on the downtown peninsula south of I-95 between the West Branch and the East Branch. While over half the land is used by industry, extensive portions of the area are occupied by residential homes or the land is in public or semi-public institutional use. The plan attempts to come to grips with actions that are required both to maintain a sound economic base and to increase the quality of living in the area. Stamford is the key to the economy of extreme southwestern Connecticut (Stamford, Greenwich, Darien, and New Canaan), since it has over 60 percent of the jobs in the 4 town area (Ref. 13).

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11 I.M. Pei & Partners, Architects and Planners. The South End, Stamford, Connecticut. A Plan for Civic and Community Initiations. Prepared for Stamford Economic Assistance Corporation, Stamford, CT, September 1980.

12 Private Communication (Ms. Toby Johnston, Southwestern Chamber of Commerce), June 12, 1981).

13 Recommended Plan for the City of Stamford, CT, 1990. Adopted by the Stamford Planning Board, May 24, 1977.

MIANUS RIVER

1.0 Harbor Description

About 2 nautical miles west of Stamford Harbor, the Mianus River widens into an area best known as Cos Cob Harbor. A dredged channel begins due west of Lowther Point and continues 1.3 miles upstream to the town of Mianus (Ref. 1). Navigation is generally not possible past this point. The channel had a controlling depth of 2 ft in April 1976, with a 6-ft depth in mid-channel for .7 mile until the Conrail railroad bridge; and then a controlling depth of 2½ ft with a mid-channel depth of 4½ ft for the remainder (Ref. 1).

Present navigational problems are mainly the result of siltation; particularly near the Palmer Point gas dock to 4 ft, a lump in the channel just south of the railroad bridge, and shoaling upriver near the head of navigation (Ref. 2). The railroad bridge's bascule span lies 20 ft above mean high water and is tended around the clock (Ref. 3). Four tenths of a mile above this the Connecticut Turnpike has a fixed span crossing with a 45-ft vertical clearance.

Land access to Mianus River is provided by two turnpike exits, each roughly 1/2 nautical mile away, and an Amtrak station in Stamford, CT.

2.0 Harbor Uses

2.1 Industrial/Commercial

There are no reported commercial users of waterborne transport (Ref. 4), except for four lobster boats with the largest vessel having a length of 32 ft and a draft of 30 inches (Ref. 3). These boats are out daily in season.

2.2 Recreational

There are seven marinas and one yacht club in the Mianus River (Ref. 5).

No.	Marina	# of Slips	Maximum Size
1	Cos Cob Municipal Boat Basin		
2	Palmer Point Marina	157	57'
3	McMichael Yacht Yard	65	
4	Harbor Marine Center	232	60' (power)
5	Mianus Marine, Inc.	32	
6	Ole M. Amundsen, Inc.	50	
7	Drenkhahn Boat Basin	(prefers not to give further information)	
8	Riverside Yacht Club		
		536+	

At present, anchorage space is being used virtually to capacity, and there seems to be demand for more (Ref. 2,6). Presently there are 183 vessels with a 4-ft draft, 128 with 5 ft, and 89 with 6 ft (Ref. 7). There are mixed types of craft in the river, but there appears to be a trend toward sailboats, with one estimate that in the past few years about 20 percent have converted from powerboats (Ref. 3,7). Deterents to this change are primarily the lack of water depth at low tide and the inconvenience of the railroad bridge to tall masts (2,6). Unless a large-scale dredging operation involving anchorage basins as well as the channel was to transpire, large sailboats with fixed keels are not expected to be able to utilize the marine facilities, despite a trend toward larger vessels (Ref. 2). Most boats in Mianus River are used often, and the fuel price situation is not expected to abate this much at all.

3.0 Projection of Harbor Activities

The on-going pattern has been toward increased boating activity in the Mianus River (Ref. 2,6). The recent development of condominiums and apartments in Stamford have induced many boaters to move their berthing location to Cos Cob Harbor (Ref. 6). Most of the shorefront land is presently used for private residences and condominums, but there are some parcels of wetlands and vacant private land. Still, development of these sites does not seem likely (Ref. 6). In fact, the most recent construction project, at Palmer Point, involved putting up a condominium on the previous location of Palmer Marine Engines (Ref. 3). The most likely eventual site for a large marina seems to be on property currently owned by Amtrak where their generating station is located (Ref. 7).

While dredging the channel would ease vessel traffic and be a benefit to marinas by encouraging them to dredge their own basins, estimates of the seriousness of a "no-action" scenario depend heavily upon the boaters' patience. If the increasingly limited opportunities to safely use their craft led many boaters to other facilities in nearby harbors, then as many as all eight marinas could close within five years (Ref. 2). If the proportion of the 3452 boaters estimated in the Greenwich-Stamford area that use Cos Cob Harbor (Ref. 8) are more tolerent, however, then there may be no serious problem for quite some time (Ref. 3). The issue of safety would primarily occur when a boater is unable to reach sheltered water to avoid a storm. It is difficult to determine the likelihood of such an event occurring.

References

1 U.S. Department of Commerce. United States Coast Pilot. Atlantic Coast: Cape Cod to Sandy Hook. 15th Edition, National Ocean Survey, Washington, D.C., January 1980.

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GREENWICH HARBOR

1.0 Harbor Description

Greenwich Harbor is about 2 nautical miles east of Port Chester Harbor and the New York-Connecticut border. Located due north of Great Captain Island between Tweed Island and Field Point, a channel has been dredged that extends from about .1 mile southeast of field Point for 1.2 miles to the town of Greenwich, at the head of navigation.

In June 1977, the controlling depth was 9 ft except for shoaling to 5 ft, 200 ft from the top. (Ref. 1) There have been complaints of boats going aground in the channel, however, that would indicate that the shoaling extends further (Ref. 2). Two federal project anchorage basins were dredged at the head of navigation and just south near the west bank. The depths were 2 to 4½ ft and 3½ to 6½ ft, respectively (Ref. 1), though considerable shoaling due to highway drainage as well as the unstable nature of the bottom's composition has occurred (Ref. 3).

The Connecticut Turnpike passes within 150 ft of the harbor, and Amtrak has a station in Greenwich.

2.0 Harbor Uses

2.1 Industrial/Commercial

No industries use Greenwich Harbor for waterborne transport (Ref. 4). Three commercial ferries bring commuters to New York as well as other destinations, and in 1978 a volume of 125,000 people was accommodated (Ref. 3,4). There are also several commercial fishing vessels in operation, the largest is 75-ft long and draws 6 ft (Ref. 3).

2.2 Recreational

There are two yacht clubs and one marina in Greenwich Harbor (Ref. 2,5,6).

No.	Marina	# of Slips	# of Moorings	Maximum Size
1	Greenwich Yacht & Boat Club	70		48' (power)
2	Grass Island Municipal Boat Basin	370	100	—
3	Indian Harbor Yacht Club	160+		65' (sail)
		600+	100	

This anchorage space is filled to capacity, and plans for expansion exist, indicating excess demand. These expansion plans are contingent upon an ability to dredge the anchorage basin, however (Ref. 6). A survey, which is done regularly and last completed in 1980, indicates a grand total of 922 boats of all sizes with a draft over 1 ft, 92 draw 4 ft, 58 take 5 ft, 51 take 6 ft, 10 take 7 ft, 11 take 8 ft, 7 take 9 ft, and 10 take 10 ft (Ref. 3). Although no vessel with a 10-ft draft currently moors in the harbor, yachts with about 100-ft lengths do enter on occasion as transients.

About 1/3 of all craft are sail, and the rate of conversion from power to sail is between 12 and 15 percent per year (Ref. 3). Vessel size is not expected to change (Ref. 2,6), since despite the fact that a sailboat costs less per ft than a power boat when sails, spars, rigging, and other equipment are considered local prices draw much closer (Ref. 3). Frequency of usage for boaters is primarily on weekends, and this is expected to become even more consistent as high fuel prices, sometimes more than $1.80 a gallon, limit powerboaters (2,3,6)

3.0 Projection of Harbor Activities

Overall activity is increasing. Some developable shorefront land is available, with most vacant land found between the inner coves and the sewage treatment plant, though the total amount available is only about 1½ acreas (Ref. 3,7). There is also marine-commercial zoning in effect that helps preserve marinas and limit placement of apartment and condominums (Ref. 3). Land usage figures that include Cos Cob Harbor show that of 33.73 miles of total available shorefront in 1975, 6.87 miles were undeveloped, 19.16 were residential, and .37 were commercial. The remainder varied (Ref. 8). No public property development is presently planned (Ref. 7).

Despite indications that there presently is a way out, even at lowtide (Ref. 6,7), dredging is felt to have "highest priority" as there has been much siltation over the past 15 years (Ref. 7). If a "no-action" scenario occurs, "all hell would break loose" among users of the harbor (Ref. 3). The exact extent of dredging required is difficult to determine, but it is clear that local pressure and interest will be maintained.

References

1 U.S. Department of Commerce. United States Coast Pilot. Atlantic Coast: Cape Cod to Sandy Hook. 15th Edition, National Ocean Survey, Washington, D.C., January 1980.

2 Private Communication (Brooks Bishop, Indian Harbor Yacht Club, June 26, 1981.

3 Private Communication (Robert Chard, Greenwich Harbor Master), June 25, 1981.

4 U.S. Department of the Army, Corps of Engineers. Waterborne Commerce of the United States, Calendar Year 1978, Part 1, Waterways and Harbors, Atlantic Coast. U.S. Engineering Division, New England, Waltham, MA, 1978.

5 Boating Almanac, Vol. 2, Boating Almanac Co, Inc., Severna Park, MD, 1981.

6 Private Communication (Chris Lagano, Greenwich Yacht and Boat Club), June 26, 1981.

7 Private Communication (Eric Brower, Assistant Town Planner, Greenwich Planning and Zoning Commission), June 4, 1981.

8 South West Regional Planning Agency, Shoreline Recreational Facilities, Tech. Report no. 2.1 (B), 1976.

PORT CHESTER HARBOR

1.0 Harbor Description

Port Chester is located 1.2 miles to the west of Great Captain Island and is situated between a breakwater built on the southern tip of Byram Point and the northern end of North Manursing Island on the west (Ref. 1). Byram River extends upwards from the entrance for roughly 4 miles but only the first 1.7 miles, below Mill Street, are considered navigable. Throughout the navigable portion, the river serves as the boundary between Connecticut and New York, with Port Chester, NY found at the top left, and Byram, CT on the right. In 1966 the controlling depth of the channel was reported as 12 ft deep at mean low water (MLW) until Fox Island, and 10 ft deep until 900 ft below the Mill Street Bridge (Ref. 2), but in November 1978 the mid-channel controlling depth was reported to be 7 ft for about .6 mile to Fox Island, 5 ft to a turning basin 1.5 miles above the entrance, and shoaling to bare to the bridge at Mill Street (Ref. 1). The project width is 150 ft to Fox Island, 100 ft for the remainder, widening to 175 ft at the turning basin (Ref. 3). The mean tidal range is 7.1 ft.

Until the turning basin, the principal navigational problem is the fixed span of the New England Thruway bridge 60 ft above the water. The channel would seem to be filling in at the rate of about 5 inches per year, and eventually this will pose additional navigational obstacles. The silting problem seems to be especially severe in the cove where most marinas are located. (Ref. 7) Above the turning basin, navigation is complicated by the shoaling, but no marine establishments are located in this region at the present time.

The New England Thruway access is about 3/4 of a mile away from most river facilities, and Route 1 comes to within 1/4 mile.

2.0 Harbor Uses

2.1 Industrial/Commercial

There are seven industrial users of Port Chester Harbor, and the total amount of waterborne commerce handled amounted to 384,550 short tons in 1978. This is a decrease from 468,530 short tons in 1969, though the regression was quite uneven (Ref. 4). Four users,

- Power Test Petroleum Corporation,
- A. Tarricone, Inc.,
- Exxon Co., USA, and
- Hoffman Fuel Co.

receive shipments by barge and various sized tankers. For 1978, 39,122 short tons of gasoline, 1,280 tons of kerosene, 163,001 tons of distillate fuel oil, and 809 tons of residual fuel oil were received (Ref. 4). Sand, gravel, and crushed rock constitute the single primary source of traffic, however, with 180,338 short tons imported by two firms: Peckham Materials Corp, and Byram Coal and Supply Corp. The Greenwich Cove Marine, Inc. uses a dock to moor floating construction equipment.

The vessels used, in the same year, consisted of 70 trips by self-propelled tankers with a draft of 10 ft to 13 ft, and 93 trips by smaller tankers. Twenty trips were made by tugboats from 7 to 12 ft in draft to guide the remaining commerce brought in by 130 trips of 10 ft draft dry cargo vessels; and 21 trips by such vessels between 8 ft and 12-ft drafts, as well as 21 tanker trips without propulsion having drafts of less than 10 ft. (Ref. 4)

Commerial lobstermen also use the channel, which is not sufficiently deep for them at mean low water.

2.2 Recreational

Six marinas are situated along the banks of Byram River (Ref. 5).

No.	Marina	# of Slips	Maximum Size
1	Byram Port Marina	35	---
2	Pearl of the Atlantic	40	25' (power)
3	Village of Port Chester Municipal Marina	128	30' (both)
4	Westchester Avenue Mar.	42	35' (sail)
5	J. Catalano & Sons	34	23' (power)
6	Rudy's Boat Livery	8	---
		287	

The anchorage space is currently filled to capacity, but there is little indication of any significant excess in demand (Ref. 6). Extension of slips out into the river and addition of moorings are being considered by the Municipal Marina, but are contingent on the additional anchorage space being dredged from 3 to 6 ft MLW. Storage capacity is for approximately 300 boats. Both power and sail operated craft are found in the harbor, and there seems to be no rapid change towards either type. Little change is seen as well for the general size of boats found; very few are over 30 ft (Ref. 7). Most recreational craft are used on weekends, and no alteration of this pattern is anticipated.

3.0 Projection of Harbor Activities

Activity in Port Chester Harbor and Byram River has remained fairly constant; a decline in commercial shipments has been matched by increased recreational enthusiasm. Available shorefront land, both vacant and developed, exists on both sides of Byram River (Ref, 6,7). Most land is zoned suitable for marinas, and plans are presently being made concerning an urban renewal program in the Port Chester waterfront area that could include new housing projects, new commercial enterprise, and passive recreation such as a park (Ref. 7). While not impossible, a new marina was not seen as likely for inclusion, however.

Maintenance dredging of the channel is important to continued commercial utilization, and dredging of marina basins prevents the losing of slips to the persistent siltation problem. A "no-action" scenario could cut commercial traffic.* A switch to using vessels with shallower drafts would be possible although a loss of an economy of scale would result. The "utility" of the marinas would be substantially reduced and a serious impact could occur in two to three years (Ref. 7).

References

1 U.S. Department of Commerce. United States Coast Pilot. Atlantic Coast: Cape Cod to Sandy Hook. 15th Edition, National Ocean Survey, Washington, D.C., January 1980.

2 U.S. Corps of Engineers. The Port of New York, NY and New Jersey, Port Series No. 5, 1978.

3 New York District, Army Corps of Engineers, River and Harbor Project Maps, June 30, 1975.

4 U.S. Department of the Army, Corps of Engineers. Waterborne Commerce of the United States, Calendar Year 1978, Part 1, Waterways and Harbors Atlantic Coast. U.S. Engineer Division, New England, Waltham, MA, 1978.

5 Boating Almanac, Vol. 2, Boating Almanac Co, Inc., Severna Park, MD, 1981.

6 Private Communication (Janet Passarelli, Westchester Avenue Marina), June 18, 1981.

7 Private Communcation (Mr. Ritchie, Village Manager for Port Chester), June 23, 1981.

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* Based on the fact that of the roughly 70 percent of all vessels that require a draft of 10 ft or more (Ref. 4), an anticipated mid-channel controlling depth of about 5 ft in 1983 would require within 3/4 of high tide for utilization, or only 25 percent. In 1978 with a mid-channel controlling depth of 7 ft only 1/2 tide was needed and vessels could utilize the channel 1/2 of the time.

MILTON HARBOR

1.0 Harbor Description

Milton Harbor is located in the City of Milton, N.Y., adjacent to Long Island Sound, and just east of Mamaroneck Habor, Rye, NY. The Federal project consists of an entrance channel 1½ miles long from the 6 ft contour in the interior harbor; an inner channel 60 and 50-ft wide, 0.15 mile long; and a branch channel 70 and 50-ft wide, 0.17 mile long. Each channel is 6 ft deep at mean low water. Controlling depths in 1976 were 5 ft at midchannel to the boat basin, 5 ft in the north and south basin channels with shoaling to bare in the center of the basin. Mean tidal range is 7.2 ft. (Ref. 1)

Recreational harbor users complain of shoaling problems affecting larger power craft and sailboats. Maintenance dredging is scheduled for the fall of 1981.

Highway access to Milton Harbor is by city streets with the New England Turnpike and other expressways within 2 to 3 miles. There is no rail access.

2.0 Harbor Uses

2.1 Industrial/Commerical

There are no documented or reported industrial/commercial users of Milton Harbor.

2.2 Recreational

The harbor is used primarily as a summer anchorage by recreational craft as it provides protection from all but southwesterly winds. Two boatyards are located in Milton Harbor. The largest marine railway can handle craft up to 50 ft long. (Ref. 2)

No.	Marina	# of Slips	# of Moorings	Maximum Size
1	Municipal Boat Basin	32		37'
2	American Yacht Club		250	

The majority of craft are sailboats (average 30 ft) and frequency of use is reported to be 2 to 3 times per week (Ref. 3). Vessels up to 60-ft length sometimes moor in the outer harbor. Use of both boatyard facilities are now used to capacity. The Milton Municipal Boat Basin reports a waiting list for lease/rental of available slips and moorings (Ref. 4).

3.0 Projections

Demand for recreational boating facilities exceeds available supply at present. The scheduled maintenance dredging should relieve some of the problems with grounding in the main channel and boat basins, but will not provide deep enough drafts for larger craft. There is limited land for expansion. The Municipal Boat Basin plans extension of 2.25 acres which could provide additional space for parking and winter storage. Local zoning regulations limit expansion of moorings on other lands.

References

1 U.S. Department of Commerce. United States Coast Pilot. Atlantic Coast: Cape Cod to Sandy Hook. 15th Edition, National Ocean Survey, Washington, D.C., January 1980.

2 Boating Almanac, Vol. 2, Boating Almanac Co, Inc., Severna Park, MD, 1981.

3 Private Communication (Mr. Kline, American Yacht Club), June 2, 1981.

4 Private Communcation (Mr. Vicker, Milton Harbor Master and Operator of the Municipal Boat Basin), June 3, 1981.

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MAMARONECK HARBOR

1.0 Harbor Description

Mamaroneck Harbor is situated on the New York Long Island Sound shoreline, about 6 miles west of the Connecticut border. Milton Point, NY is just east of the Harbor and Orient Point marks the western side of the entrance. The channel, dredged in 1933, starts one-half mile southeast of Orient Point and is 10 ft-deep for almost a mile until it meets the East and West Basin channel intersection. For the first 0.6 mile the width is 100 ft; after this the main channel and both basin channels have a width of 80 ft. (Ref. 1,2). The East Basin channel, completed in 1965, was dredged to 8 ft while the West Basin channel is 6-ft deep and was just dredged last fall.(Ref. 2) The mean tidal range is 7.3 ft (Ref. 3).

Several dangerous rocks are found near the harbor entrance, but all are buoyed. About one-fourth mile in from Orient Point, a bottleneck occurs where two points of land currently come very close to, but do not actually restrict, the main channel.(Ref. 4) In the East Basin there have been reports of shoaling to 2 ft at the east corner.

While no bridges cross the navigable portion of Mamaroneck Harbor, Route 1 comes to within 300 ft of both basins.

2.0 Harbor Uses

2.1 Industrial/Commercial

In the past, Mamaroneck Harbor had water shipments of sand, gravel, and oil. These operations have been discontinued.(Ref. 4) At present there is one charter fishing boat and two lobster boats that run almost daily. The charterboat has a 6 to 8-ft draft, while the lobster boats both have shallow drafts. There is also one commercial boatyard that constructs vessels for use by the Army and the Coast Guard, as well as large private yachts. Located in the north end of the East Basin, even the largest boats of 125 ft manage to get out at most times.

2.2 Recreational

There are six marinas in Mamaroneck Harbor, all located in either the basins or their channel (Ref. 5):

No.	Marina	# of Slips	Maximum Size
1	Total Yacht Sales of Mamaroneck	70	33' (sail)
2	Mamaroneck Boats and Motors	112	35' (power)
3	Nichol's Yacht Yards	180	46' (sail)
4	East and West Basins	400	
5	Post Road Boat Yard	40	
6	Robert E. Derecktor Shipyard	26	
		828	

Four yacht clubs are also situated in the harbor. The total number of boats using the harbor this season is nearly 1400, including those that utilize boat ramps (Ref. 2), so about 500 boats anchor at the yacht clubs. The anchorage space is currently being used virtually to capacity, and demand greatly exceeds capacity. (Ref. 6) Sailboats can be found in greater numbers, though no trend away from powerboats was indicated.(Ref. 6,7) The largest sailboat, requiring the greatest draft, is 46 ft-long. A trend was seen from small (16 ft) to medium (23 ft) boats in the past few years. The average usage for a vessel is once a week with some indication that fuel price increases were having an effect on the length of time that powerboat engines were left running--which would tend, in many instances, to indicate a shorter run. No changes in frequency or length of usage was seen in the near future.

3.0 Projection of Harbor Activities

The number of boats in Mamaroneck Harbor has remained essentially constant for the past five years.(Ref. 2) Recreationally this is because there has been little expansion to meet demand. Marinas can expand their capacity by rearranging slips, extending slips out into the water, or buying more shorefront land and construcuting more slips. The first means is quite expensive, considering the additional revenues that the few new slips will provide. Also, most marinas currently have quite space-efficient arrangements. Extension out into the water will almost always have an adverse effect on safe navigation. The third option, land expansion, may be occasionally open to the marina. In Mamaroneck Harbor, there are currently four available acres of building lots along the waterfront.(Ref. 4) The major obstacle to most marinas is not availability but price. An acre of undeveloped shorefront land with a commercial zoning is currently worth between $300,000 and $500,000. Even residentially zoned land becomes very expensive when bordering the calm waters of a sheltered inlet.(Ref. 8) Most marinas would also be expected to pay the entire amount in cash before taking ownership. Credit terms would be beyond the range of all but

the very largest operations. There is currently one shorefront area being developed for cluster housing.(Ref. 2)

While dredging to any new depths does not seem to be presently justifiable, maintenance dredging is important. Some marinas have expressed an interest in a group dredging effort to reduce costs.(Ref. 6) The Village of Mamaroneck forbids formation of land containment sites and the dumping ground off of New Haven is seen as the best solution to the disposal problem. A "no action" scenario would cause increasing inconvenience to channel users, and make private maintenance dredging of anchorage space more expensive since a contractor will not already be dredging in the area. The smaller marinas might well be the most threatened (Ref. 9), and some could fold fairly soon.

References

1 New York District, Army Corps of Engineers, River and Harbor Project Maps, June 30, 1975.

2 Private Communcation (Mr. Sheridan, Milton Harbormaster), June 4, 1981.

1 U.S. Department of Commerce. United States Coast Pilot. Atlantic Coast: Cape Cod to Sandy Hook. 15th Edition, National Ocean Survey, Washington, D.C., January 1980.

4 Private Communication (Mr. Spinelli, Engineer for the Village of Mamaroneck), June 9, 1981.

5 Boating Almanac, Vol. 2, Boating Almanac Co, Inc., Severna Park, MD, 1981.

6 Private Communication (the Yard Master, Nichol's Yacht Yard), June 2, 1981.

7 Private Communication (Total Yacht Sales of Mamaroneck), June 2, 1981.

8 Private Communication (Mr. Banks, Houghton and Banks, Inc.), June 17, 1981.

9 Private Communcation (Mrs. Charlene Bergstrom, CT Marine Trade Association), June 3, 1981.

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NEW ROCHELLE HARBOR

1.0 Harbor Description

New Rochelle Harbor is found at the southern end of the City of New Rochelle, NY, and is approached between Glen Island and Davenport Neck (Ref. 1). The main channel begins between Neptune Island and the southeast end of Davenport Neck and extends .6 mile north-northeast to a point about 300 ft below the dam near Leland Avenue (Ref. 2). The controlling depth was 8 ft in 1971, though there are indications that this has shoaled to a fair degree (Ref. 3,4). The width of the project is 120 ft. There is also a second dredged channel, however, that extends from a point between Hog Island and Glen Island inwards in a 60 degree arc for .4 mile (Ref. 2) towards Travers Island. The depth is 7 ft and the width is 100 ft. The tidal range is 7.3 ft at virtually all harbor locations.

Besides a siltation problem in New Rochell Harbor behind Davenport Neck, the principal obstruction is an outcropping of marked and unmarked rocks, covered 3 ft, off the southwest end of Glen Island for an area of 30 ft by 60 ft. Although waters leading to the entrance of the harbor from David's Island 4000 ft offshore are generally quite deep, these rock outcrops create a navigational concern (Ref. 1). There is also a drawbridge between Neptune and Glen Islands with a clearance of 13 ft; and although there currently is a bridgetender stationed there 24 hours a day, there are many arguments being put forth concerning eliminating the $50,000 a year salary position (Ref. 5). No other bridges in the harbor interfere with navigation.

The nearest main highway access is provided by Route 1, 3/4 of a nautical mile away.

2.0 Harbor Uses

2.1 Industrial/Commercial

There are presently no commercial users utilizing waterborne transport except a charter boat that operates from Fort Slocum Dock on Neptune Island, and a ferry to David's Island (Ref. 5,6). A total of 61,000 people were transported (round trip counted twice) in 1978 (Ref. 6).

2.2 Recreational

The primary vessel traffic in New Rochelle Harbor is recreational. In fact, anchorage in the harbor is specifically not recommended except at a marina or yacht club due to the congestion of pleasure boats (Ref. 1). A total of ten marinas and yacht clubs occupy New Rochelle Harbor either behind Davenport Neck or between Neptune

and Travers Islands (Ref. 7).

No.	Marina	# of Slips	Maximum Size
1	NY Athletic Club/ Yacht Club		
2	Huguenot Yacht Club		
3	Cameron's Boat Yard	20	30' (both)
4	Town Dock Yacht Club		
5	North Atlantic Marine Enterprises	130	35' (power)
6	Fisher Marine Sales & Service	130	42' (power)
7	The Pappy V Yacht Yard	120	
8	Castaways Yacht Club		
9	Imperial Yacht Club	110	50' (power)
10	West Harbor Yacht Service	35	35'+ (sail)
		545+	

The area anchorage space is filled to capacity, and demand continues to grow (Ref. 3,4). Power boats predominate, and while it is hard to be sure, it seems that few switches to sailboats have been made, or soon anticipated. Shallow water seems to be more of a factor where it exists than fuel prices, but enjoyment from owning a powerboat is probably the main deterent to any changes (Ref. 3). Boaters in this affluent county are not overly concerned with the relative merits of sailboat cost.

Vessels range from roughly 16 to 50 ft, and no drastic alteration in boat size can be seen in the near future. The frequency of use varies with the purposes the boat is utilized for and while the average is presently about once a week (Ref. 3), no general change in habits has been warranted.

3.0 Projection of Harbor Activities

An increasing amount of activity has been occurring in New Rochelle Harbor, and this is expected to continue (Ref. 3,4,5). While most land along the shore is currently single-family residential or multi-dwelling units, there still are a few vacant parcels that could be used for marina construction (Ref. 5). Some of these areas are "buffer zones", however, between present marinas and houses, and are unlikely to be developed. An act amended by the City of New Rochelle in 1979 created a new "commercial-marine district" in which only maritime operations are permitted. A re-zoning of the west end of Neptune Island to this code is recommended by the New Rochelle Department of Development in order to preserve the "scenic resources" that current marinas provide by prohibiting apartments or industry not related to boating (Ref. 5). A similar proposal has been made for the north bank of Davenport Neck. The principal development program that has been put forth is to re-zone, and proceed to build housing complexes on Wright Island, east of Neptune Park. The idea is to

concentrate shoreline housing to leave more pristine conditions elsewhere (Ref. 5).

The channel to the north of Glen Island is silting in fairly rapidly, which effectively prevents large sailboats, with fixed keels, from gaining access a significant portion of the time. This does not seem to bother most boaters and becomes more of an inconvenience to the few who would use vessels with greater than a 7-ft draft. The channel to the south, however, is obstructed not only by the large rock outcropping mentioned earlier but elsewhere as well, and is felt to be unable to handle the additional traffic that would result if the Glen Island Bridge is to be fixed (Ref. 5). Savings from the bridge inactivity should sizeably contribute to a local share of dredging expenses. A potential containment site is located in the inlet on Glen Island's south shore, and this could also contribute to reduced costs both locally and nearby. A bulkhead would enclose an area of roughly 1000 ft by 450 ft and is seen as serving in all probability as additional parking space (Ref. 5). Environmental effects as well as neighborhood reaction should be considered. A "no-action" scenario in either channel would limit the number of hours during which many boaters could operate and would aggrevate an already serious traffic situation. In roughly five years, several marinas would be affected significantly by boating delays and loss of slips, since many impatient boaters would plan to berth elsewhere.

It would seem, however, that the south channel is worse than the north and should be given higher priority. Such a decision also should consider that more direct community benefit is also expected. (Ref. 5)

References

1 U.S. Department of Commerce. United States Coast Pilot. Atlantic Coast: Cape Cod to Sandy Hook. 15th Edition, National Ocean Survey, Washington, D.C., January 1980.

2 New York District, Army Corps of Engineers, River and Harbor Project Maps, June 30, 1975.

3 Private Communication (Fisher Marine Sales and Service), June 3, 1981.

4 Private Communication (Imperial Yacht Club), June 11, 1981.

5 City of New Rochelle Department of Development, Local Coastal Management Program, March 1980.

6 U.S. Department of the Army, Corps of Engineers. Waterborne Commerce of the United States, Calendar Year 1978, Part 1, Waterways and Harbors Atlantic Coast. U.S. Engineer Division, New England, Waltham, MA, 1978.

7 Boating Almanac, Vol. 2, Boating Almanac Co, Inc., Severna Park, MD, 1981.

ECHO BAY HARBOR

1.0 Harbor Description

Echo Bay Harbor is located one nautical mile northeast of New Rochelle Harbor, near the town of New Rochelle, NY, between Davenport Neck and Premium Point. A plan modified in 1973 from its original adoption in 1910 led to the dredging of a channel 200 ft out from Duck Point on the west shore, to a turning basin .3 mile to the northwest at the entrance to the Southwest Branch. The authorized width and depth of the channel are 100 ft and 10 ft, respectively. (Ref. 1) The waters surrounding the entrance to the harbor and the channel on the west side are naturally deep, averaging 13 ft at mean low water. The east side is not nearly as accessible and an anchorage basin covering 35 acres with at least 6 ft of water has been a subject of investigation. This basin would be only partially sheltered from southwestern to southeastern storms. The tidal range is about 7 ft on the average. (Ref. 2)

A definite silting problem exists in the Southwest Branch (Ref. 3).

No bridges cross Echo Bay Harbor anywhere, yet the Boston Post Road (Route 1) comes within 200 ft of the North Branch Protion.

2.0 Harbor Uses

2.1 Industrial/Commercial

Besides small independent fishermen, and a small boatyard with a 10-ton marine rail system capable of lifting up to a 40 ft craft, the only commercial operation in Echo Bay Harbor is importing sand, gravel, and crushed rock by Nestad Material Corporation, located at the end of the channel (Ref. 4). A tugboat and a dry-cargo vessel, both with a draft under 8 ft, are used; in 1978 the tonnage was 1,080 (Ref. 5). A 3,750 c.y. facility for open storage is available in the rear.

2.2 Recreational

There are currently two marinas and one yacht club in Echo Bay Harbor (Ref. 6).

No.	Marina	# of Slips	# of Moorings	Maximum Size
1	Polychron Marina Co.	80	0	31' (power)
2	New Rochelle Municipal	455	125	55' (power)
3	Echo Bay Yacht Club			
		535	125	

Anchorage space is completely utilized at present, and over 1000 more slips could be sold (Ref. 3). More powerboats than sailboats use the Southwest Branch where both marinas are found. Despite the fact that this branch is "not conducive to sailboats," it was felt that within a period of 10 to 15 years an almost complete transition to sailing craft could be seen. Higher fuel prices were seen as the primary catalyst for this change. The impediment to this alteration of vessel type preference is seen to be a silting problem that occurs mainly due to "mud waves" from the vicinity of the five islands located in the Northeast Branch of the harbor. (Ref. 3) The average frequency of use is two times a week, and while this has remained fairly stable on a per capita basis, the number of boats out on a given day is actually decreasing. This trend, most pronounced among those that fish and use boats often, is due to "boat-pooling" in which several mariners share rides on each other's vessels. (Ref. 2)

3.0 Projection of Harbor Activities

Boating growth has not subsided due to fuel prices, or any other factors. A recurrent limitation to accommodation of this increasing enthusiasm for both pleasure boating and commercial activity is the availability of shorefront land that can be used for expansion. While not yet non-existent, such parcels of land are quite scarce and very costly. While some waterfront commercial enterprises may be able to vie in a cost-effective manner with industries, housing complexes and offices that make no use of their advantageous location, most marinas are simply not able to provide the same income per square foot for their owner as a high-rise housing complex.

Dredging in a marina's anchorage space would allow an increase in income from holding larger crafts; and dredging the channel would be a supplement to additional income by allowing more convenience in scheduling boat trips at lower points of the tide and in allowing the marinas to use the same dredging company at an adjacent time to save costs. The same logic holds true for a commercial user, though for him the "inconvenience" becomes more costly. A decision to dredge Echo Bay Harbor's main channel, then, would have direct and indirect benefits in larger incomes for water users. The rest of the community, however, benefits far less and may not be willing to finance beyond a small fraction of the cost. A "no-action" scenario, for either financial or environmental reasons, would allow a gradual deterioration (Ref. 3), and in roughly 8 to 10 years the problem would increase sharply in severity as decreasing usage time would begin to cut significantly into incomes.

References

1 New York District, Army Corps of Engineers, River and Harbor Project Maps, June 30, 1975.

2 Private Communication (Polychron Marina), June 3, 1981.

3 Private Communcation (Mr. Barret, New Rochelle Municipal Marina), June 3, 1981.

4 U.S. Corps of Engineers. The Port of New York, NY and New Jersey, Port Series No. 5, 1978.

5 U.S. Department of the Army, Corps of Engineers. Waterborne Commerce of the United States, Calendar Year 1978, Part 1, Waterways and Harbors Atlantic Coast. U.S. Engineer Division, New England, Waltham, MA, 1978.

6 Boating Almanac, Vol. 2, Boating Almanac Co, Inc., Severna Park, MD, 1981.

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EAST CHESTER CREEK

1.0 Harbor Description

The entrance to East Chester Creek is at the mouth of the Hutchinson River and empties into East Chester Bay. The mouth of the river is located approximately 1 mile north-northeast of Cherry Tree Point on the west bank of East Chester Bay, and Rodman Neck and Turtle Cove to the east. The mouth of the river is approximately 400 yds wide although navigation is limited to a channel much narrower. The Hutchinson River or East Chester Creek is navigable to the city of Pelham, about 2.6 miles up the river. Controlling depths in September 1978 for the channel were 6 ft for a width of 150 ft from the entrance to the Hutchinson River Parkway Bridge; 4.5 ft for a middle width of 75 ft to a point 150 yds above the thruway bridge; then 5 ft for a middle width of 50 ft to the junction of the East and West Y's. (Ref. 1)

In September 1978, a 3-ft shoal existed along the northern edge of the channel about 67 yds east of Pelham Parkway Bridge, and a 3.5-ft shoal along the southern edge of the channel about 5 yds southeast of the Hutchinson River Parkway Bridge.

The bridges and overhead cables crossing the Hutchinson River include the Pelham Parkway bascule bridge 0.2 mile above the mouth of the river with a clearance of 13 ft; the Amtrak Lift Bridge, 0.3 mile, clearance 8 ft and a overhead power cable at the bridge with 130 ft clearance; the Hutchinson River Parkway Bridge 0.7 mile, clearance 30 ft; the New England Thruway bascule bridge 1.7 miles, clearance 31 ft; a bridge 1.9 miles upstream, clearance 50 ft; an overhead pipeline 2.2 miles, clearance 130 ft; and a drawbridge 2.3 miles upstream from the mouth of the river. (Ref. 2)

Important land transportation routes include the Pelham Parkway, Hutchinson River Parkway, the New England Thruway, the Boston Post Road, and Conrail which maintains rail service through the area. All routes cross the river as cited above.

2.0 Harbor Uses

2.1 Industrial/Commercial

The Hutchinson River provides a means of transporting a wide variety of waterborne cargo both into and out of the area. The greatest tonnage of products brought into the area are various petroleum products. In 1978, 864,295 tons of gasoline and 374,284 tons of distillate fuel oil were taken up the river along with 317,287 tons of sand, gravel, and crushed rock. These products account for 556 tanker trips in which 278 required a 10-ft draft, 9 with 9-ft drafts, 200 with 8-ft drafts, and 69 with 7-ft or less draft. Also 966 tugboat trips with 10-ft drafts or less were required to assist 281 non-propelled dry cargo vessels with 10-ft draft, and 16 dry

cargo vessels with 9-ft draft or less, as well as 173 non-propelled tankers with 10-ft draft, 25 with 9 to 7-ft draft, and 200 with 6-ft draft or less. On return trips, 11,566 tons of iron and steel scrap were exported. The Pascap Co., located on the west bank of the Hutchinson River, approximately 0.1 mile above the New England Thruway Bridge, accounted for the area's scrap metal shipments. While Plaza Materials Corp., located east of Provost Avenue, accounted for the various rock and gravel carrying vessels coming up the river. (Ref. 4)

2.2 Recreational

Pelham Bay Park, with an area of 2118 acres, runs in a northeasterly direction from the west bank and crosses the river just north of its discharge point into East Chester Creek Bay, and continues on the east bank. The park facilities include picnic areas, a beach, and limited boat facilities (Ref. 4). No marina facilities presently exist in the Hutchinson River, although three marinas are located in nearby East Chester Bay.

3.0 Projection of Harbor Activities

The main activity on the Hutchinson River is tanker and barge traffic. The overall tonnage of products entering and leaving the river has decreased since 1973. In 1973 1,974,777 tons of various products were transported on the river; this decreased to 1,627,502 in 1978 (Ref. 1). However, the banks of the Hutchinson River are extensively developed with residential, commercial, and industrial facilities, and water transport of cargo to and from their facilities will continue to be important in the future. Although no serious navigational problems due to shoaling are currently evident, maintenance dredging to maintain current shipping activities will likely be required periodically over the long term. Extensive new development is not likely due to lack of additional available land.

References

1 New York District, Army Corps of Engineers, River and Harbor Project Maps, June 30, 1975.

2 U.S. Corps of Engineers. The Port of New York, NY and New Jersey, Port Series No. 5, 1978.

3 U.S. Department of Commerce. United States Coast Pilot. Atlantic Coast: Cape Cod to Sandy Hook. 15th Edition. National Ocean Survey, Washington, D.C., January 1980.

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WESTCHESTER CREEK

1.0 Harbor Description

Westchester Creek is located in the Bronx, New York, on the north bank of the East River, between Old Ferry Point and Clason Point (Ref. 1). The Creek is navigable for about 2.3 miles, where depths of 2.5 ft prevent passage above the town of Westchester. The channel was dredged in the fall of 1980 to 17 ft (Ref. 2). The width is 100 ft for 2000 ft above the entrance, 80 ft wide for the next 3000 ft, and 60 ft for the remainder, with widening at bends (Ref. 3). There are no reported navigational problems, except a bascule bridge with a mean high water clearance of 14 ft. This bridge, carrying the Bruckner Boulevard, is located in Unionport, 1.7 miles above the entrance to the channel and can be opened upon request. the horizontal clearance is 60 ft, the exact width of the channel (Ref. 4). At this point, the mean tidal range is 7.0 ft. Local roads provide access on both sides of Westchester Creek.

2.0 Harbor Uses

2.1 Industrial/Commercial

The primary industrial users of Westchester Creek are three oil storage facilities, all on the west bank (Ref. 5). CIBRO Terminal, Inc. has a storage capacity of 2 million gallons and a throughput of 585,000 barrels of oil a year. Amerada Hess has a storage capacity of 1.5 million gallons and has 1.1 million barrels as its throughput. Schildwachter and Sons, Inc. has the largest storage capacity of the three with 3 million gallons and throughputs of 1 million barrels a year. All receive shipments by barge, and Schildwachter also uses a small tanker. (Ref. 4) In addition, the H.O. Penn Company occasionally receives shipments of heavy machinery by barge. The only other commercial establishments that utilize water transport are Cummings Diesel Sales, which handle recreational boat repairs as well as new sales; and the New York City Depository for High Explosives, which may rarely take shipment by boat.

2.2 Recreational

Two marinas use Westchester Creek for an anchorage basin (Ref. 6).

No.	Marina	# of Slips	# of Moorings	Maximum Size
1	Higgs Marine Service,Inc.	14	3	40'+(sail)
2	Conroy's Marine Sales and Service	24		45' (power)
		38	3	

All available slips and moorings are currently being used and it would seem likely that expansion will be considered if a continuation in increased boating enthusiasm exists. A major obstacle to such a trend in this 80 percent powerboat area is the rising price of fuel. (Ref. 7,8) The measures taken to adapt to higher operating expenses are either shorter trips or buying a sailboat. There is an indication of the latter (Ref. 7), but the effect upon potential new boaters is unclear and would involve the relative merits of each type of vessel. Many larger powerboats are equipped to use lower cost diesel fuel and some smaller powerboat owners have been trading up in size to save on fuel costs (Ref. 8). The average boat owner uses his craft two times a week in season and this would seem to be lessening, per capita, if anything.

3.0 Projection of Harbor Acitivites

The overall direction of the usage of Westchester Creek is an increase. Commercial barging especially has been more frequent (Ref. 8). There are, however, no plans for expansion of port facilities at this time. Non-marine oriented land development has been occurring lately along the east bank by private concerns. On the western shore an urban renewal project has been proposed for the Lion's Project south of the Bruckner Boulevard and also along Zerega Avenue above the Boulevard. The large amount of vacant land available in the former would possibly allow inclusion of a marina, no vacant land exists in the latter region. Some city-owned land is also available on both sides of the creek where it joins the East River, but these places are slated for use as parks and passive recreation.

Maintenance dredging is not currently needed. A "no-action" scenario would have virtually no effect until at least 10 years in the future. Even then the problem would develop quite gradually.

References

1 U.S. Department of Commerce. United States Coast Pilot. Atlantic Coast: Cape Cod to Sandy Hook. 15th Edition, National Ocean Survey, Washington, D.C., January 1980.

2 Private Communication (Higgs Marine Service), June 1, 1981.

3 New York District, Army Corps of Engineers, River and Harbor Project Maps, June 30, 1975.

4 U.S. Army Corps of Engineers, Board of Engineers for River and Harbors; Port Series No. 5, The Port of New York, NY and New Jersey, revised 1978.

5 Private Communication (Geno Palenti, Bronx City Planning Commission), June 15, 1981.

6 Boating Almanac, Vol. 2, Boating Almanac Co, Inc., Severna Park, MD, 1981.

7 Private Communication (Higgs Marine Service), June 2, 1981.

8 Private Communcation (Conroy's Marine Sales), June 2, 1981.

BRONX RIVER

1.0 River Description

The Bronx River is on the north side of the East River, between Clason Point and Hunts Point (Ref. 1) Flushing Bay is located directly south across the East River. The Bronx River channel starts due east of the furthest extension of Hunts Point and proceeds north-northwest for 2.6 miles up to a point parallel to East 172 Street. The portion of the river up to East 177 Street above this is to be filled in by the City of New York (Ref. 1,2), but as of 1980 an amphitheater has even been proposed along the river's east bank below East 177 Street that would take advantage of the aesthetics of flowing water (Ref. 3). In any case, this portion is not considered navigable (Ref. 4). The controlling mid-channel depths in July 1972 were 9 ft from the entrance to the Westchester Avenue Bridge, and only 1 ft beyond this point (Ref. 1).

Navigation hindrances consist mainly of bridges. The Westchester Avenue Bridge has a vertical clearance of 14 ft, but the draw no longer is opened. In a similar fashion, the Conrail railroad bridge, .1 mile above, has a rolling-lift span that is no longer operated. The height above the water is 8 ft. The Bruckner Boulevard Bridge, 1.7 miles above the entrance, presents far fewer restrictions on vessel passage since the bascule span 27 ft above the water can be raised by a bridgetender who must be contacted via radio-telephone (Ref. 1).

Nearby road networks are extensive though actual access to the banks is limited, with only a few paths for industrial usage that lead right to the river's edge (Ref. 3). The mean tidal range is 6.9 ft.

2.0 Harbor Uses

2.1 Industrial/Commercial

The primary waterborne traffic on the Bronx River consists of sand, gravel, and crushed rock (Ref. 1). A concrete mixing plant, Transit-Mix Concrete Corp., receives shipments by barge. Also the Bronx Iron and Metals ship scrap metal by barge totalling 95,066 tons in 1978 (Ref. 5). The other major user is the Claire Fishing Fleet, whose largest boat measures 60 ft and departs daily (Ref. 6). The mooring area was just dredged under U.S. Army Corps of Engineers supervision in 1980. (Ref. 3)

2.2 Recreational

There are a few party fishing vessels, but no marinas or yacht clubs currently in the Bronx River. A project that may very well include construction of a marina, or at

least a boat rental facility, has been started, however, in the Soundview Park area under the Westchester Avenue Bridge. (Ref. 4)

3.0 Projection of Harbor Activities

Activity in the Bronx River is not expected to change greatly (Ref. 4). If a marina is constructed then recreational boating will obviously increase, perhaps even by more than would be expected. The proximity of the Bronx River to Westchester County might cause well-to-do individuals with little boating experience to buoy and operate a first boat close to home, rather than travel long distances to use it. There is an indication of an area trend towards less experienced but richer boaters. (Ref. 7)

There is acreage available for development besides that being presently developed in the Soundview Park area. With the exception of "medium density", residential space bordering for about 4000 ft just above Clason Point, all the shorefront land is zoned for either light or medium industry (Ref. 3). Below the Westchester Avenue Bridge, the need to dredge is minor and a "no action" scenario would have minimal impact upon craft movements for a fair amount of time. The portion of the river above this bridge has no marine users and would need operative bridges as well as dredging to make this area fully able to support any type of waterborne activity.

References

1 U.S. Department of Commerce. United States Coast Pilot. Atlantic Coast: Cape Cod to Sandy Hook. 15th Edition. National Ocean Survey, Washington, D.C., January 1980.

2 New York District, Army Corps of Engineers, River and Harbor Project Maps, June 30, 1975.

3 Bronx River Restoration, Master Plan, 1980

4 Private Communication (Mr. Zinn, Bronx City Planning Commission), June 5, 1981.

5 U.S. Corps of Engineers. The Port of New York, NY and New Jersey, Port Series No. 5, 1978.

6 Private Communication (Mrs. Anderburg, Bronx River Restoration), June 8, 1981.

7 Private Communcation (Mr. Fenton, Thwaites Marina on City Island), June 3, 1981.

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FLUSHING BAY

1.0 Harbor Description

Flushing Bay is located along the southern shore of the East River, approximately 3 nautical miles from Throgs Neck. The entrance to Flushing Bay is between the Town of College Point to the east and La Guardia Airport 0.6 mile to the southwest. A dredged channel extends past a turning basin at the head of Flushing Bay, and continues into the tributary of Flushing Creek for a total length of 2.9 miles. In December 1978, the controlling depth was 14 ft at mid-channel until the basin, 8½ ft in the turning basin, and 11 ft to just below the first highway bridge. (Ref. 1) The remaining 0.7 mile had a depth of 7 ft. The width is 300 ft for the first 1.8 miles, 200 ft until the North Boulevard bridge 0.7 mile to the southeast, and tapering to 170 ft at the head of navigation (Ref. 2). The mean tidal range has been stated as 6.7 ft (Ref. 1,2), but unofficial estimates have run as high as 9 ft (Ref. 3).

Flushing Bay is a shallow inlet (average depth is under 6 ft) to start with, but the construction of La Guardia Airport has created a "cul-de-sac" that prevents the flushing action of silt flow passing near Riker's Island (Ref. 3,4,5). A geometric progression is felt to be the result; such that the more it silts, the faster it accumulates (Ref. 4). Another contribution to these conditions was the construction of a 2800-ft breakwater in 1962 above Flushing Meadow Lakes. The head flow has been reduced significantly; the wall should have been breached at 1400 ft to allow water flow, particularly at low tide (Ref. 4).

Road access is excellent, with the Grand Central Parkway merging into the Whitestone Parkway and Van Wyck Expressway about 500 ft away from the bay. Highway runoff also undoubtedly contributes to siltation. An elevated railroad track crosses at this head of navigation, and the Long Island Railroad passes only 1000 ft to the south.

2.0 Harbor Uses

2.1 Industrial/Commercial

There are 13 known commercial users of Flushing Bay and Creek. Waterfront Sand and Stone, Ltd., Columbia Asphalt Co., Blackman Plumbing Co., Mac Asphalt Contracting Co., Jet Asphalt Co., and Colonial Sand and Stone Co receive shipments of sand, gravel, and crushed rock (Ref. 6). In 1978 the total amount imported was 709,370 tons (Ref. 7). This figure includes the commerce of Clancy Brick Sales, who received brick by barge. Metropolitan Petroleum Co., Premium Oil, and Sunrise Oil

Co. import petroleum products; 737,270 short tons were brought in during 1978 (Ref. 6,7). 60,000 tons of building cement were received by Marquette Cement Manufactoring Co.; and 40,461 tons of waste and scrap were shipped out by the City of New York 31st Avenue Loading Station for the Department of Sanitation (Ref. 6,7).

These waterborne transports required 65 trips by self-propelled tankers, and 1,574 trips by non-propelled barges and tankers. Of these, 1592 had a draft of 13 ft or less (Ref. 7). 779 tugboat trips were required, though in 757 of these instances, the draft was 12 ft or less.

2.2 Recreation

There are 12 marinas and yacht clubs in Flushing Bay (Ref. 8)

No.	Marina	# of Slips	# of Moorings	Maximum Size
1	Nichol's World Fair Mar.	365	0	112' (power)
2	Adria Marina	40	0	35'+(power)
3	Williamsburg Yacht Club			
4	Henry Knese, Inc.	10	0	35'+(power)
5	Crow's Nest Yacht Club			
6	Skyline Marina	120	0	135' (power)
7	Arrow Yacht Club			
8	Mayer Boatworks	300+	0	
9	Frank Tiborsky Marine	9	80	35' (power)
10	Klein's Boat Yard	9	150	---
11	Flushing Bay Yacht Club			
12	T & W Marine Service	20	0	35' (power)
		805+	230+	

Anchorage capacity is full at most establishments, though some marinas are being hurt by high gas prices and shallow water (Ref. 3). Excess demand is still present, though down from 250 percent above capacity in the early 1970's (Ref. 3), and there are at least 2500 boats that are using the bay this season (Ref. 9). Power boats predominate, and a trend to sailing craft has been estimated at only 2 percent (Ref. 3). While most boat sizes seem pretty constant, averaging about 23 ft (Ref. 3), sales volume is increasing in the 50-60-ft range (Ref. 5); there is also a trend toward boat quality (Ref. 3). Weekend vessel users are by far the most frequent, and this is not expected to change.

3.0 Projection of Harbor Activities

Overall harbor activity has declined somewhat from the early 1970's though it still remains quite strong (Ref. 3,4,5,7,9). Available land is virtually non-existent (Ref. 3,4,5). Plans for expansion center around prospects of dredging, both in the

channel and at private facilities. A Coastal Area Survey being currently undertaken by the New York District of the Army CE (Ref. 4), and a hydraulic flow model (Ref. 10) both examine the effects of siltation in the bay. A "no-action" scenario would increase the delay required to get out by recreational boaters; presently most are "grounded" at mean low water (Ref. 9). One marina is already closing this year; without dredging the situation will become serious for many others in under 3 years (Ref. 3). A dredging permit using containment of dredged materials (backfill) was applied for by Mayer Boatworks, but was blocked due to environmental objections (Ref. 3).

References

1 U.S. Department of Commerce. United States Coast Pilot. Atlantic Coast: Cape Cod to Sandy Hook. 15th Edition. National Ocean Survey, Washington, D.C., January 1980.

2 New York District, Army Corps of Engineers, River and Harbor Project Maps, June 30, 1975.

3 Private Communication (Rudi Lava, Skyline Marina), June 3, 1981

4 Private Communication (Mr. Beckles, Community for Flushing Bay), June 15, 1981.

5 Private Communication (Mr. Webster, Nichol's World Fair Marina), June 2, 1981.

6 U.S. Corps of Engineers. The Port of New York, NY and New Jersey, Port Series No. 5, 1978.

7 U.S. Department of the Army, Corps of Engineers. Waterborne Commerce of the United States, Calendar Year 1978, Part 1, Waterways and Harbors Atlantic Coast. U.S. Engineer Division, New England, Waltham, MA, 1978.

8 Boating Almanac, Vol. 2, Boating Almanac Co, Inc., Severna Park, MD, 1981.

9 Private Communication (Mr. Vicarelli, NY Dept. of Ports and Terminals), June 19, 1981.

10 Private Communication (Mr. Ketes, SECRA Div. of NY City Planning), June 4, 1981.

EAST RIVER

1.0 River Description

The East River, 14 miles long, connects Long Island Sound with New York Upper Bay. The entrance from the Sound is between Throgs Neck to the north and Willets Point to the south; though City Island, 1½ nautical miles away, is also included in this description. The Upper Bay entrance is between the Battery and Governor's Island. A federal main-channel provides 35 ft of water from Throgs Neck to the Brooklyn Navy Yard, currently inactive, and 40 ft for the remaining 2 miles to New York Upper Bay. (Ref. 1) The project width is 550 to 1000 ft in the eastern portion, and 1000 ft for the western 2 miles (Ref. 2). Supplementary channels include east of Roosevelt Island from the main channel to 43rd Drive, Long Island City, with a width of 500 to 900 ft and a depth of 30 ft; between South Brother and Berrian Islands, 300 ft wide and 30 ft deep; and South Brother Island Channel 400 ft wide (Ref. 2).

Shoaling to various depths exists along the shores, though federal projects have provided for removal of Coenties Reef to 40 ft, Fulton Ferry Reef to 25 ft, Jay Street Reef to 25 ft, Corlears Reef to 35 ft, Shell Reef to 25 ft, Horns Hook Reef to 40 ft, Rhinelander Reef to 26 ft, and the reef off Oak Point to 30 ft (Ref. 2). There is also considerable siltation on the west side of City Island which has not been corrected (Ref. 3). A dike was also constructed in Pot Cove at Hell Gate. Hell Gate is located midway between the ends of the East River and is noted for its difficulty of navigation due to its rapid currents with heavy swirls, crooked channel, and heavy traffic. Between Negro Point and Hallets Point in Hell Gate, vessels will occasionally be forced to pass starboard to starboard (Ref. 1).

In the East River the flood current sets east and the ebb sets west. This is the direct opposite of Long Island Sound. The current velocity is 1 knot at Throgs Neck, 2 knots at Port Morns, and about 4 knots at Hell Gate, where the velocity is 3.5 knots, eastward and 4.6 knots westward (Ref. 1). The mean range of the tide is 7.1 ft at Willets Point, 5.1 ft at Hell Gate, and 4.5 ft at the Battery. Vessels proceeding in the South Brothers Island Channel with a height of 125 ft or greater will interfere with the glide path to La Guardia Airport. Such vessels must notify the control tower prior to using the channel.

Several major spans cross the East River, but the limit on passage is presented by a bridge from Roosevelt Island to Long Island, 5.6 miles above the Battery. Its clearance is 40 ft in down position, and 99 ft when raised vertically (Ref. 1). A fixed highway bridge with 52 ft clearance at mean high water goes from Rikers Island to Long Island City, but can be avoided to the north (Ref. 2). There is excellent highway

access and Amtrak rails cross the East River at Wards Island.

2.0 Harbor Uses

2.1 Industrial/Commercial

The East River is primarily used by industries. "Both sides of the East River, from the Battery to Port Morris, a distance of 9 miles, present an almost continuous line of wharves except where shoals or currents prevent access." (Ref. 1) In 1978 there were 82 operative industrial or commercial facilities utilizing waterborne transport, including 12 sources of fuel for power plant consumption (Ref. 2). For the same year, a total of 16,193,852 short tons were handled. Items shipped in or out ranged from raw cotton to soap to scrap metal; but the primary items were fresh fruits and tree nuts, 275,856 tons; coffee, 156,427 tons; crude petroleum, 33,637 tons; limestone, 34,839 tons; sand, gravel and crushed rock, 252,263 tons; prepared fruit and vegetable juice, 29,496 tons; sugar, 222,458 tons; lumber, 84,873 tons; sulphuric acid, 20,532 tons; basic chemicals, 27,131 tons; gasoline, 230,100 tons; kerosene, 47,825 tons; distillate fuel oil, 2,110,208 tons; residual fuel oil, 9,965,060 tons; building cement, 168,641 tons; motor vehicle parts, 29,193 tons; iron and steel scrap, 65,015 tons; and waste, 1,987,913 tons (Ref. 4); 15,338 trips (round trip counted once) were required by both propelled and nonpropelled vessels. Discounting the 11,300 tug boats with a draft of 18 ft and less that were required to guide the nonpropelled vessels, 676 had drafts between 19 and 40 ft, and 25,785 had a draft of 18 ft or less. Overall, commercial activity has been fairly steadily decreasing since 1969, when 25,296,618 tons were handled. (Ref. 4)

2.2 Recreational

Recreational boating is of secondary importance in the East River. Not including City Island, there is one marina and one yacht club along the East River. City Island is quite close to the East River, however, and 15 marinas and yacht clubs are located there (Ref. 5).

An increase in recreational boating has been occurring, particularly in the City Island region, though not all anchorage space is being used to capacity (Refs. 3,6). A fairly even mixture of power and sail exists, and while no change in this is expected, there has been a trend noticed as wooden hulled vessels are being phased out to fiberglass craft. This "quality trend" is due to the fact that the average boat owner is becoming less experienced, but richer (Ref. 3). Pleasure boating happens primarily on weekends, and higher fuel prices are expected to have an effect only as to the hours a boat is left running--the total hours used are quite likely to remain constant (Ref. 3).

No.	Marina	# of Slips	# of Moorings	Maximum Size
1	N.Y. Skyports Marina	34	0	35'+(power)
2	Point Yacht Club			
3	Sonny's Boat Club	0	30	35' (sail)
4	Portside Marina	80	0	35' (power)
5	City Island Yacht Sales	10	0	35' (power)
6	Anna's Harbor Inn	35	0	35' (sail)
7	Thwaites Marina	100	0	55' (both)
8	Stelfer Boats and Motors	40	0	35' (power)
9	Kretzer Boat Works	55	0	35'+ (both)
10	Sagman's Marine	100	34	--
11	Harlem Yacht Club			
12	Stuyvesant Yacht Club			
13	City Island Yacht Club			
14	Morn's Yacht & Beach Club			
15	Consolidated Yachts, Inc.	80	0	23' (power)
16	Minneford Yacht Yard	60	12	--
17	Olympia Yacht Club	0	120	--
		584+	196+	

3.0 Projection of Harbor Activities

Overall activity in the East River is not increasing rapidly--nor can it since virtually all land, even on City Island, is already being used (Refs. 3,6). Plans for development would probably center upon reactivating dormant facilities, though on City Island condominium developers are carefully scrutinizing present marina sites (Ref. 7). To counteract excesses in this direction, an agreement to zoning limits with regard to marine facilities has been reached by the City Planning Commission (Ref. 7).

Water depths are generally quite sufficient, and a "no-action" scenario would have no serious adverse impact in the near future. The west side of City Island, however, is in need of maintenance dredging. A "no-action" scenario for that portion would lead to slip losses and inconvenience to pleasure boaters, eventually forcing marinas to close (Ref. 3).

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1 U.S. Department of Commerce. United States Coast Pilot. Atlantic Coast: Cape Cod to Sandy Hook. 15th Edition, National Ocean Survey, Washington, D.C., January 1980.

2 U.S. Corps of Engineers. The Port of New York, NY and New Jersey, Port Series No. 5, 1978.

3 Private Communication (Mr. Fenton, Thwaites Marina), June 3, 1981.

4 U.S. Department of the Army, Corps of Engineers. Waterborne Commerce of the United States, Calendar Year 1978, Part 1, Waterways and Harbors Atlantic Coast. U.S. Engineer Division, New England, Waltham, MA, 1978.

5 Boating Almanac, Vol. 2, Boating Almanac Co, Inc., Severna Park, MD, 1981.

6 Private Communication (Sonny's Boat Club), June 2, 1981.

7 Private Communication (Geno Palenti, Bronx Planning Commission), June 16, 1981.

LITTLE NECK BAY

1.0 Harbor Description

Little Neck Bay extends from the south side of the East River in Queens, NY. Approximately 2 miles west of Manhasset Bay, the entrance lies in deep water between Fort Totten and Saddle Rock. About 2400 ft in, at a point in the middle of the entrance, a 200-ft side channel exists that was dredged to a depth of 7 ft for about 1000 ft (Ref. 1). Beyond this are 350 acres of anchorage space, also 7-ft deep at mean low water. No bridges span Little Neck Bay. The mean tidal range is 6.7 ft.

The main navigational obstacle is the time that recreational boaters must wait in order to set out. A 5-ft draft vessel can only be used for the three hours surrounding high tide (Ref. 2). A sunken barge in the west side was also reported.

Ready transportation access is provided by the Cross Island Parkway, which runs adjacent to the west shore of the bay. The Long Island Railroad also crosses Alley Creek, a tributary to the bay, at its southernmost end.

2.0 Harbor Uses

2.1 Industrial/Commercial

There are no reported commercial users of Little Neck Bay that utilize waterborne transport (Ref. 3,4). Two small, independent boatyards, however, make recreational boat hull and engine repairs.

2.2 Recreational

Two marinas and a yacht club utilize Little Neck Bay (Ref. 2,5,6).

No.	Marina	# of Slips	# of Moorings	Maximum Size
1	Nichols Bayside Marina		150	50' (sail)
2	Douglaston Yacht Club			
3	Great Neck Estates		40	36' (sail)

This anchorage space is currently being used to capacity; the boating demand, slightly down for the past few years due to the fuel crisis, is now moving in an upwards direction (Ref. 2). Most of the boats using the bay facilities are sailboats (Ref. 5,2), though opinions conflicted as to what the future composition would be. No changes in average boat length were foreseen, however, with a roughly 25-ft craft being expected to continue to be most frequently found.

The average boater uses his vessel about four times a week, and the primary change in the near future is the anticipation that more trips will be made on weekday nights after "working hours". (Ref. 5)

3.0 Projection of Harbor Activities

Traffic in Little Neck Bay is increasing, and barring any rapid change in fuel prices, this will likely continue. Despite the availability of shorefront land (Ref. 5), the price apparently is prohibitive for there are no reported plans for development. This does not necessarily mean that the boating enthusiasm needed for expansion is absent, for a marina may have to make a quite significant capital investment in order to expand, including financing the land purchase, dredging the anchorage space, and construction of facilities --money the marina may not find available. As far as maintenance dredging of the channel or parts of the anchorage basin that start to shoal, while this would unquestionably benefit the marine community. If no action is taken, the marinas can be expected to adapt, with some inconvenience,to the vicissitude of the tide. Conditions will progressively worsen, though no serious effects are expected in the short term.

References

1 New York District, Army Corps of Engineers, River and Harbor Project Maps, June 30, 1975.

2 Private Communication (Steve Bender, Great Neck Estates Park Boat Basin), June 15, 1981.

3 U.S. Department of the Army, Corps of Engineers. Waterborne Commerce of the United States, Calendar Year 1978, Part 1, Waterways and Harbors Atlantic Coast. U.S. Engineer Division, New England, Waltham, MA, 1978.

4 U.S. Corps of Engineers. The Port of New York, NY and New Jersey, Port Series No. 5, 1978.

5 Private Communcation (Mr. Theodorou, Nichols Bayside Marina), June 2, 1981.

6 Boating Almanac, Vol. 2, Boating Almanac Co, Inc., Severna Park, MD, 1981.

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MANHASSET BAY

1.0 Harbor Description

Manhasset Bay is located southeast of Hart Island and City Island, New York. The entrance to the harbor lies between Hewlett Point to the west, and Barker Point to the east, a distance of approximately 1 mile. The depths in the outer part of the bay range from 12 to 17 ft and 7 to 12 ft in the part inside Plum Point. The extreme south end of the bay is shallow with mud flats. A natural channel exists almost to the head of the bay, with a depth of 2 to 6 ft. Five areas within the harbor are defined as special anchorages with four of them being on the east side of the bay. A seaplane restricted area is located between Plum Point and Tom Point. (Ref. 1)

Sandbar and silting problems are presently occurring in the northeast section of the harbor. Boats with drafts greater than 5 ft can no longer leave port during low tide (Ref. 2,3). The mean tidal range in the bay is 7.3 ft. (Ref. 1)

Land transportation routes provide access to the east side of the bay via Routes A25, 101, and Plandome Road. The area is also serviced by railraod up to the village of Port Washington. Access to the westside of the bay is by East Shore Road. The bay is also accessible by air via seaplane.

2.0 Harbor Uses

2.1 Industrial/Commercial

Industrial and commercial uses of the harbor include the transportation of sand, gravel, building materials, and petroleum products (Ref. 1). In 1978, 368,543 tons of petroleum products entered the harbor on 137 non-self propelled tanker trips and 5 self-propelled tanker trips drawing drafts on the average of 8 ft. Also during this time, 232 tug or towboat trips were made into the bay, resulting in a total of 374 inbound trips and 377 outbound trips. (Ref. 4)

2.2 Recreational

Manhasset Bay is used extensively for recreational boating, especially by power boats. However, a trend towards increased use of sailing vessels is foreseen if proper drafts are maintained in the bay. The largest size boats presently accommodated are approximately a 90 ft powerboat and a 43 ft sailboat. Since sailing craft require deeper drafts, and increased navigation problems are occurring in the area, a decrease in the size of sailing craft using the bay is expected. There are numerous small-craft facilities at Port Washington and to the east and west of Tom Point at Manorhaven (Ref. 5).

No.	Marina	# of Slips	# of Moorings	Maximum Size
1	Kennilwood Yacht Club			
2	Broadlawn Harbor Yacht Club			
3	Grace Harbor Dock			
4	Shelter Harbor Harmina			
5	Port Washington Yacht Club			
6	Manhasset Bay Yacht Club			
7	Knickerbocker Yacht Club			
8	Gus's	0	20	
9	Flagship Yachts LTD	0	20	35'+ (sail)
10	North Hemstead Town Dock	0	397	
11	Fearon Marine Service	55	0	35' (power)
12	Gulfway Marine Service	50	0	
13	Manhasset Bay Marina	250	0	55' (power)
14	Weston Marine Service	15	0	35'+(power)
15	Gold Coast Marine	24	0	35' (power)
16	Tom's Point Marina	115	0	35' (power)
17	Joe Whites Marine Service	50	30	35'+(power)
18	Riviera Marina			
19	North Shore Yacht Club			
20	Capri Marina	270	20	90' (power)
		829+	487+	

Manhasset Bay experiences heavy weekend boater traffic by boat owners from the nearby metropolitan areas. Marina capacity is limited because of the strong interest in pleasure boating and resulting large numbers of craft docked and maintained in the area (Ref. 2,3).

3.0 Projection of Harbor Activities

Industrial and commercial activity is not expected to increase. In 1973 427,002 tons of petroleum products entered the bay, while in 1978 368,543 tons were contained in the in-bound traffic. Petroleum laden vessels comprise most of the industrial/commercial activity in the bay (Ref. 4). However, an increase in port activity is expected in the coming years as a result of the increased number of pleasure craft utilizing the bay and its facilities. The shoreline around Manhasset Bay is heavily developed, especially with marine-related establishments. Any further development at this time is uncertain and not expected to occur at least in the northeast part of the bay.

The problems of silting and sandbar formations are resulting in a need for maintenance dredging. This is evident in the area northwest of Port Washington where marina operators are experiencing navigation problems due to poor draft. Although boaters like Manhasset Bay because of its location and numerous marine services, a decrease in boater traffic and loss of revenue to the marina operators could occur as

boat owners find the navigation problems of the area out weighing the other positive factors of the bay (Ref. 2,3).

References

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2 Private Communication (Lawrence, Capri Marina), June 3, 1981.

3 Private Communication (Tom Hane, Manhasset Bay Marina), June 3, 1981.

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5 Boating Almanac, Vol. 2, Boating Almanac Co., Inc., Severna Park, MD, 1981.

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HEMPSTEAD HARBOR

1.0 Harbor Description

Hempstead Harbor is 4 miles wide between Matinecock and Prospect Points where it meets Long Island Sound, about 20 miles east of New York City. This narrows considerably so that the width is 1/2 nautical mile between Carpenter Point and the opposite shore due west, the portion utilized in waterborne transport and recreation facilities. Another mile to the south is Bar Beach, which provides a narrow inlet leading to a completely sheltered area. Navigation continues for another 2 miles below this to the town of Roslyn on the east. Water depths are variable, though ones approaching 11 ft can usually be found. The mean tidal range is 7.1 ft. (Ref. 1)

A plan, adopted in 1910 and modified in 1968 calls for a 2.3 mile-long channel, 13-ft deep, with a width of 150 ft for the first 21 miles and 70 to 80 ft for the remainder. However only the last .2 mile has been done, to a depth of 6 ft (Ref. 1), though the majority of the project had a depth of 4 ft in 1968 (Ref. 2).

Quite significant silting has been occurring (Ref. 3,4). In some shore areas utilized by marine establishments, the mean low water level is only 2 ft (Ref. 3). One bridge, carrying the North Hempstead Turnpike, crosses Hempstead Harbor about .2 mile above the head of navigation, with a fixed clearance of 51 ft (Ref. 2). This turnpike (Route 25A) provides excellent highway access.

2.0 Harbor Uses

2.1 Industrial/Commercial

Most of the sand and gravel moved by Long Island Sound water transport originates in Hempstead Harbor (Ref. 4). Facilities located on both East and West Shore Roads handled 3,039,339 short tons of sand, gravel, and crushed rock in 1978; 2,507,196 tons of which were exported (Ref. 5). Other facilities received 696,236 tons of various petroleum products. For 1978, 24 trips were required by self-propelled vessels, all with a draft between 10 and 14 ft. Tugboats with a maximum draft of 13 ft made 1356 trips to escort 2669 barge trips of which 2029 had a draft of 6 ft or less. 247 non-propelled tanker trips were also guided with 216 having drafts between 10 and 14 ft (Ref. 5). A project by the LI Lighting Co. (called Mitchel Gardens) was scheduled to be completed May 1981, and provide energy using solid waste as fuel (Ref. 6).

2.2 Recreational

There are two reported recreational facilities (Ref. 7).

No.	Marina	# of Slips	# of Moorings	Maximum Size
1	Harry Tappen	272	0	44' (sail & power)
2	Sea Cliff Yacht Club	0	100	51' (sail)

Anchorage capacity is almost filled, and a strong "consumer market" is available for boating (Ref. 3,8). Boat types are mixed, though some boat owners are trading power for sail (Ref. 8). No clear indication can be found for boat sizes, though first-time owners generally purchase a smaller-than-average boat (Ref. 3). Heavy weekend use happens throughout the season, and unless the inconvenience that shallow waters create becomes serious, the frequency of use should remain stable (Ref. 3,8).

3.0 Project of Harbor Activities

Overall activity in Hempstead Harbor is declining slightly despite increased pleasure boating (Ref. 3,6,8). Almost all shorefront land is presently developed (Ref. 3,8). Local interest seems to be toward urban redevelopment (Ref. 4), though no specific plans are known. Certain locations need removal of silt, whether or not there is a need for channel dredging that can be economically justified; at least as of 1978 it is not clear and would depend upon the benefit of an increased economy of scale. At least ten marina owners along Hempstead Harbor, and also in Glen Harbor and Cove, who navigate Hempstead Harbor waters feel a "no-action" scenario would be inappropriate (Ref. 3). Barge accidents could also happen, and general traffic may well decrease sharply (Ref. 3).

References

1 New York District, Army Corps of Engineers, River and Harbor Project Maps, June 30, 1975.

2 U.S. Department of Commerce. United States Coast Pilot. Atlantic Coast: Cape Cod to Sandy Hook. 15th Edition. National Ocean Survey, Washington, D.C., January 1980.

3 Private Communication (Ms. Hurley, Sea Cliff Yacht Club), June 3, 1981

4 Private Communication (Bruce Bergman, Planner for NY District Army CE), June 10, 1981.

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6 Northeast Power Coordinating Council, Regional Reliability Council: Long Range Coordinated Bulk Power Supply Program, April 1, 1981.

7 Boating Almanac, Vol. 2, Boating Almanac Co, Inc., Severna Park, MD, 1981.

8 Private Communication (Lou Parente, Harry Tappen Boat Basin), June 4, 1981.

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GLEN COVE CREEK AND HARBOR

1.0 Harbor Description

Glen Cove Harbor, also known as Mosquito Cove, is located about 3 miles back on the eastern edge from Matinecock Point in the outer portion of Hempstead Harbor. The harbor is sheltered in all directions except from the west, and is roughly semicircular in shape. At the easternmost end a narrow inlet, Glen Cove Creek, extends 1 mile to the city of Glen Cove. A dredged channel begins near the middle of Glen Cove Harbor about .2 mile from the mouth of Glen Cove Creek, and extends just under 5000 ft into the creek, with 350 ft left to the head of navigation. The project was originally 8-ft deep (Ref. 1); but as of June 1974 the controlling mid-channel depth was 7 ft for the first .6 mile, then 2 ft to within 150 yds of the head of navigation, with shoaling to bare for the remainder (Ref. 2). Portions of this channel were maintenance dredged in 1978 (Ref. 3).

Siltation is occurring to the extent that even experienced mariners are finding it hard to navigate (Ref. 4). Barge operators who plow through near low tide create an upwelling of materials leading to deposition adjacent to shoreline facilities (Ref. 3). Overhead power cables near the head of navigation have an authorized clearance of 65 ft (Ref. 2).

Highway access is good, though there are no major turnpikes in the area, and a train station can be found just over 1/2 mile away from the head of navigation (Ref. 2).

2.0 Harbor Uses

2.1 Industrial Commercial

While no waterborne commerce transpires in Glen Cove Harbor, there are several industrial users in Glen Cove Creek. Primarily sand, gravel, and crushed rock is handled with shipments of 183,891 tons in 1978 (Ref. 5). Also, 47,186 tons of petroleum products were received for the same year, and 4000 tons of waste and scrap were removed. All commercial vessels operating in the creek had a draft of 12 ft or less. In 1978, 3 self-propelled tanker trips were made; and in addition 212 tugboat trips were required to assist 182 non-propelled dry-cargo vessels and 26 non-propelled tankers (Ref. 5). There are also several fishing vessels (Ref.4).

2.2 Recreational

Four marinas and yacht clubs use Glen Cove Creek and Harbor (Ref. 6). Anchorage capacity is virtually filled and there is demand for more (Ref. 3.4). A mixture of sail and power utilize the creek and harbor, and the only effect seen upon trends in type or size was directly related to the dredging of marinas. A trend from

power boats to larger sailboats is very likely to be thwarted by shallow water, leading to an influx of smaller sailboats, or no change at all (Ref. 3,4). Most boaters use their craft on weekends, though a decrease in powerboat trips due to high fuel prices was noted (Ref. 4).

No.	Marina	# of Slips	Maximum Size
1	Brewer Yacht Yard	110	---
2	Glen Cove Yacht Service	285	55' (sail)
3	Glen Cove Marina	220	60' (power)
4	Hempstead Harbor Club		
		615+	

3.0 Projection of Harbor Activities

Overall activity is increasing, though the growth of pleasure boating is decidedly faster (Ref. 3,4). There are some parcels of shorefront land available, and plans are in effect for a new combination condominium and marina on the north side of Glen Cove Creek about .5 mile from the mouth (Ref. 3,4). There is an expressed need for maintenance dredging to maintain current marine activities and expansion of same (Ref. 3,4). However, marina expansion, including private dredging of dockage areas, is believed to be hampered by "red tape" associated with lengthy permitting procedures (Ref. 4). A "no-action" scenario would not encourage marina expansion, but would rather provide incentive to leave the business. Barge traffic, especially those containing fuel, would pose an increased hazard by running aground and splitting open (Ref. 3).

References

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2 U.S. Department of Commerce. United States Coast Pilot. Atlantic Coast: Cape Cod to Sandy Hook. 15th Edition. National Ocean Survey, Washington, D.C., January 1980.

3 Private Communication (Mr. Davids, Glen Cove City Yacht Service), June 4, 1981.

4 Private Communication (Mr. Ackerly, Glen Cove Marina), June 3, 1981.

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6 Boating Almanac, Vol. 2, Boating Almanac Co., Inc., Severna Park, MD, 1981.

HUNTINGTON HARBOR

1.0 Harbor Description

Huntington Harbor is located behind a narrow inlet at the southwest end of Huntington Bay, NY about 33 miles east of New York City. The entrance is between West Neck to the west and Sandy Point (also known as Wincoma Point) to the east. In some pockets, depths in this completely sheltered harbor may reach 30 ft (Ref. 1). A channel 100-ft wide, 8'ft deep, and 2.2 miles long beginning .5 mile beyond the entrance was dredged by 1904 (Ref. 2). Completion in 1941 of an addition of .2 mile with the same width by a depth of 6 ft, as well as a 14 acre anchorage basin 6 ft in depth to the west of this addition have facilitated access for harbor users in the southernmost region (Ref. 2), where the village of Huntington is located.

There are few siltation problems within the harbor (Ref. 1,3), though there is a boulder reef outside the harbor to the west of the entrance (Ref. 4). The mean tidal range is 7.4 ft (Ref. 2).

Local roads encompass almost the entire perimeter of Huntington Harbor, providing good vehicle access.

2.0 Harbor Uses

2.1 Industrial Commercial

Three types of industry receive shipments by water in Huntington Harbor. In 1978 there were 250 tons of unprepared shellfish, 182,264 tons of sand, gravel, and crushed rock, and 17,828 tons of distillate fuel oil handled (Ref. 5). All vessel trips with any commercial function used boats with a draft of 13 ft or less; of these, 1139 trips were by self-propelled dry cargo vessels for 1978. In addition, 3 trips were made by self-propelled tankers, and 22 tugboat trips were required to assist 142 non-propelled dry-cargo vessels and 6 such tankers (Ref. 5).

2.2 Recreational

There are 12 marina and yacht clubs with facilities in Huntington Harbor (Ref. 6), making pleasure boating a significant activity. Anchorage capacity is presently filled, and there is demand for more (Ref. 1,3). Most craft are sailboats, with the largest being up to 60-ft long. A progression to sail is occurring, probably due to higher fuel prices. The average size boat is 35 ft (Ref. 1), sizeably above a more widespread average of about 26 ft (Ref. 1). The frequency of use is generally towards heavy activity on weekends during the season, and this is not expected to change (Ref. 1,3)

No.	Marina	# of Slips	# of Moorings	Maximum Size
1	Gold Star Battalion Park Boat Basin	0	400	35' (both)
2	Harbor Boating Club			
3	Morningtime Marine Corp	0	100	23' (both)
4	Regal Marine Service	0	60	35' (both)
5	Mill Dam Marina			
6	Willis Marine Center	190	0	45' (both)
7	Huntington Town Dock	10	0	Transient only
8	Coney's Marine	7	175	35'+(sail)
9	Ketewomoke Yacht Club			
10	Halesite Marine	66	0	
11	Knutson's Marina	80	0	35'+(both)
		353+	335+	

3.0 Projection of Harbor Activities

Overall activity is unclear, though recreational boating is definitely increasing. While much open land exists, there are no known plans for either marine or non-marine related establishments (Ref. 1,3). Water depth is adequate for the harbor's needs, and a "no-action" scenario would have no significant impact in the near future.

References

1 Private Communication (Mr. Acker, Bay Constable's Office), July 1, 1981.

2 New York District, Army Corps of Engineers, River and Harbor Project Maps, June 30, 1975.

3 Private Communication (Mr. Mart, Willis Marine Center), June 3, 1981.

4 U.S. Department of Commerce. United States Coast Pilot. Atlantic Coast: Cape Cod to Sandy Hook. 15th Edition. National Ocean Survey, Washington, D.C., January 1980.

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NORTHPORT HARBOR

1.0 Harbor Description

Northport Harbor is located in the southeast corner of Northport Bay, Long Island, NY. Access to Northport Bay is by means of Huntington Bay, which is due west. The entrance to Northport Harbor is between Bluff Point on the east bank and Little Neck Point on the west bank, a distance of about 0.6 mile. The mean depth at the harbor's entrance is approximately 8 to 10 ft as of early 1979. This depth decreases to 6 to 8 ft in a southeast direction from the harbor's entrance. The west side of the harbor is shallower with a depth of 2 to 4 ft. A low man-made grass covered island in the southwestern part of the harbor serves as a bird sanctuary and is surrounded by a channel from 5 to 7 ft in depth, and less than 300-ft wide. Access to a marine facility located within a small inlet east of the island is provided by this channel. The mean tidal range is about 7 ft. (Ref. 1)

The marine facility located in the inlet is attempting to dredge the area, but is hampered by the lack of an adequate disposal site. About 15 years ago dredging took place to create the "County Channel" with a specified depth of 15 ft, however, work was not completed. At present, sand and silting problems exist, especially along the southeastern bank of the harbor. Drafts have decreased in some areas by 4 ft over about the last 10 years. Sailboats using the harbor have had to become especially aware of tidal conditions as periods of low tide make navigation hazardous (Ref. 2). Vessels using Northport Harbor must select an anchorage according to draft in the harbor. During severe winters ice may close the harbor (Ref. 3).

Access to Northport Harbor is by means of Route A25 which lies south of the harbor, and roads running in a northern direction on both sides of the harbor from Route A25. A railroad spur is located about .75 mile inland from the lower east bank of the harbor.

2.0 Harbor Uses

2.1 Industrial/Commercial

Commercial and industrial traffic in Northport Harbor in 1978 consisted of the import of 25,347 tons of residual fuel oil. This commodity was carried in vessels with a draft of 8 ft or less, and assisted by tug or tow boats. Fourteen self-propelled dry cargo vessel trips were also made during this period with similar drafts (Ref. 4).

An application for conversion to coal from oil has recently been made by the Long Island Lighting Co. (Ref. 5). The power facility lies 1.5 miles northeast of

Northport Harbor. A coal slurry pipeline would run from the existing off-shore (petroleum) terminal two miles to the shore and thence to the power plant (Ref. 5,6).

2.2 Recreational

Northport Harbor supports primarily recreational boating, with available slips and mooring space extremely low (Ref. 7).

No.	Marina	# of Slips	# of Moorings	Maximum Size
1	Center Port Yacht Club			
2	Northport Marine Center	250		67' (power)
3	Woodbine Marina			
4	Saymour Boat Shops		350	50' (power)
5	Northport Yacht Club			

Powerboats and sailboats in equal numbers commonly use Northport Harbor. Powerboats of up to 67 ft can be accommodated, while smaller size sailboats are limited to harbor use. An increase in the number of sailboats in the harbor has been noticed; however, this may be reversed if adequate drafts are not maintained (Ref. 2,8). Boating activity in the harbor is quite active during the week as well as the weekend, and slightly more so than in previous years (Ref. 2).

3.0 Projection of Harbor Activities

An increase in recreational activity is expected in the coming years with the number of sailing craft out-numbering powerboats. A large portion of the shoreline around Northport Harbor is tidal wetland making future development uncertain, although a desire to expand on an adjacent wetland was expressed by one marina operator; the State of New York has been made aware of these plans (Ref. 2).

A need for dredging in the near future has been expressed and could contribute to a wider range of expected port activity. The lack of action on this front will result in the limiting of large vessels, primarily sailboats, from using the port and resulting loss of revenue to the marina operators (Ref. 2,8)

References

1 New York District, Army Corps of Engineers, River and Harbor Project Maps, June 30, 1975.

2 Private Communication (Mr. Fisher, Northport Marine center), June 1981.

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PORT JEFFERSON

1.0 Harbor Description

Port Jefferson is located on the south shore of Long Island Sound in New York, and eastward of Old Field Point. Entrance to the harbor is through a dredged channel that leads between two jetties to a docking area near the southwestern end of the harbor. Mount Misery Shoal with depths of 7 to 12 ft lies about 0.8 mile north-northeast of the harbor's entrance (Ref. 1). Dredging of the harbor's channel dates back to 1903 when it was first dredged to 12 ft by the Federal Government. Since then private interests have performed dredging operations. In 1930 the channel was dredged to 16 ft and in 1957 to 26 ft (Ref. 2). As of May 1970, the controlling depth in the channel was 23 ft, and the width approximately300 ft. In 1970 depths of 32 ft were available in the docking area. A small basin at the northeast end of Port Jefferson Harbor was dredged by sand and gravel operations to depths of about 18 ft. The remaining area has a depth of about 10 to 12 ft. The edges of the basin have wrecks and considerable shoaling. Shoaling is also a problem in the channel. Shoals with little depth exist at the harbor's entrance and for approximately 0.5 mile into the harbor (Ref. 1).

Since 1957 the channel has lost approximately 3 ft in depth when compared with information obtained in 1970. This represents a channel siltation rate of approximately 2.7 inches per year (calculated from depth in 1957 and 1970, Ref. 1,2). The jetties at the harbor's entrance have aided materially in maintaining the width and depth of the dredged channel between them. Lengthening of the east jetty is expected in the future to help further maintain the integrity of the harbor's entrance. other future work may include dredging of the channel to 40 ft deep and 350 ft wide; and creation of a turning basin at the inshore end of the channel 30 ft deep at mean low water, 700 feet wide, and 1400 ft long (Ref. 2). Any dredging of the channel at this time would enhance navigation for commercial and industrial enterprises as recreational boaters find the present channel adequate (Ref. 3). The mean tidal range is 6.6 ft (Ref. 2).

The closest railroad facilities are approximately 1 mile south of the lower end of the harbor. Where there are no turnpikes in the area, Route 25A passes right by the harbor and provides good road access. Access to Port Jefferson is also provided by the Bridgeport/Port Jefferson Steamboat Co.

2.0 Harbor Uses

2.1 Industrial/Commercial

Port Jefferson is utilized by a variety of commercial and industrial enterprises. Bridgeport-Port Jefferson Steamboat Co. operates a ferry boat with the capacity to carry 1061 passangers and up to 100 tons of cargo such as automobiles. In 1978, 25,055 automobiles, and accompanying passengers, entered Port Jefferson. The boat when full has a 10.5-ft draft. (Ref. 4,5)

In 1978, 4,407,276 tons of various products entered Port Jefferson Harbor. The bulk of the products being gasoline and distillate fuel oil, totaling 1,613,409 ton and 1,692,077 tons, respectively. Other commodities entering the harbor include shellfish, 15 tons; sand, 305,666 tons; jet fuel 18,685 tons; kerosene, 6,325 tons; residual fuel oil, 768,510 tons; petroleum and coal products, 2,568 tons; aircraft and parts, 16 tons; and other items totaling 5 tons. These items arrived in port contained in vessels requiring drafts of 38 ft or less, with the majority of vessels drawing a draft of 12 ft or less. (Ref. 4)

In 1978, 199 self-propelled tanker trips were made and 551 non-self-propelled tanker trips. Tankers requiring a draft of 25 ft or greater numbered 66, while 684 tanker trips required drafts under 25 ft. Approximately 45 percent of these drew drafts of 12 ft and less.

Self-propelled passenger and dry cargo vessel trips totaled 2,599, all drawing drafts 12 ft and less. Non-self-propelled passenger and dry cargo vessel trips numbered 245 with similar draft requirements. Towboats or tugboat trips totalled 830 with 693 having drafts of 12 ft and less. The maximum draft required by these vessels was 17 ft (Ref. 4).

The total number of commercial/industrial vessel trips into Port Jefferson Harbor in 1978 was 4,424, with a similar number of outbound trips recorded (Ref. 4).

Commercial petroleum handling facilities at Port Washington include the Mobil Oil Corporation which can handle 1 barge of 20,000 barrel capacity and has a storage capacity of 259,523 barrels; the Exxon Corporation which can handle one barge of 15,000 to 20,000 barrel capacity and has an on-site storage capacity of 53,570 barrels; Swezey Fuel Co., Inc. which can handle one barge of 15,000 to 20,000 barrel capacity and a storage capability of 53,570 barrels; the Consolidated Petroleum Corporation with a tank farm 3 miles away and Long Island Lighting Company (LILCO). All but LILCO receive petroleum products for later distribution over land routes (Ref. 6).

LILCO, with a net generation of 2,647,344 (1000) Kwh (Ref. 7), and located on the westside of the harbor, receives residual fuel for plant combustion. Berthing space

is adequate for one or two barges up to 100,000 barrels or one tanker up to 180,000 barrel capacity. Four storage tanks with a capacity of 630,000 barrels are located nearby. Port Jefferson is the largest petroleum product receiving port on the north shore of Long Island.

Non-petroleum related facilities include the Bridgeport/Port Jefferson Steamship Co., and McLain Dock and Store Co. (Ref. 6). Several small commercial fishing boats also operate out of Port Jefferson Harbor.

2.2 Recreational

Approximately three facilities handle recreational boat traffic and are situated at the lower end of the harbor (Ref. 8).

No.	Marina	# of Slips	Maximum Size
1	Port Jefferson Yacht Club		
2	Port Jefferson Town Marina	130	54' (power)
3	Bayles Dock	6	

Anchorage space at Port Jefferson is limited to the establishments listed above. Some space exists in the previously mentioned basin; however, no direct access to land is possible from this location. The harbor supports power and sailing craft in about equal numbers; however, an increase in the number of sailing craft has been noticed in the last few years. Power boats up to 54 ft have little problems operating in the harbor, but large size sailboats are somewhat limited in navigation due to unsuitable water depths in close proximity to the marinas. Most pleasure boating activity occurs on the weekend, and is expected to increase for the summer months. (Ref. 3)

3.0 Projection of Harbor Activities

Over the years, commercial and industrial activity has grown at a much faster rate than new recreational facilities. This has resulted in the limiting of public access to the waterfront. For this reason, the village of Port Jefferson broke from its parent town of Brook Haven and become incorporated in itself. Brook Haven, located inland from the harbor, had little concern for maintaining the quality of the harbor unlike the shoreline residents of the village. Port Jefferson was now free to write its own zoning laws which were to include strict new guidelines to prevent any further commercial development. The residents of Port Jefferson want the harbor to serve the people of the town and not just the industries located on its shore. Because of this, no new development of port facilities is expected although land is available for development (Ref. 9). Any development of existing land will most likely be for residential or

marine recreation activities. Redevelopment of the waterfront is possible by relocating oil terminals which would increase public access to the water. Headlands around the harbor are being acquired for public purposes by Suffolk County (Ref. 10).

The proposed dredging plan is not welcomed by the local residents, who have been characterized as "xenophobic" in not even liking what is presently in operation (Ref. 11). Public sentiment is that the project will allow larger tankers to operate in the port and increase the risk of spills, while these tankers try to navigate through the narrow opening into the harbor; will serve a purpose only for LILCO and the Consolidated Petroleum Co.; and will result in environmental damage from both the dredging operation and the expected increase in marine accidents. The dredging plan has the support of the Nassau-Suffolk Planning Board and is presently awaiting funding by the Department of the Army (Ref. 10,12).

Alternatives to the dredging project include construction of a pipeline originating in New Jersey or the construction of an offshore loading installation located in Long Island Sound that would be cooperatively owned (Ref. 6).

If nothing is done, tankers and the like with deep drafts will be required to lighten their loads before using the port facilities which is costly and increases the chance of accidents or oil spills.

References

1 U.S. Department of Commerce. United States Coast Pilot. Atlantic Coast: Cape Cod to Sandy Hook. 15th Edition. National Ocean Survey, Washington, D.C., January 1980.

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4 U.S. Department of the Army, Corps of Engineers. Waterborne Commerce of the United States, Calendar Year 1978, Part 1, Waterways and Harbors Atlantic Coast. U.S. Engineer Division, New England, Waltham, MA, 1978.

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10 Ralph M. Field and Associates. LIS Regional Study: Land Use Inventory Report, U.S. Dept. of Housing and Urban Development, Boston, MA, Feb. 1974.

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MATTITUCK INLET

1.0 Harbor Description

Mattituck Inlet is 6.7 miles southwest of Horton Point, located on the northern coast of Long Island. Entrance to the inlet is between two short jetties and can be recognized from offshore as a long break in the bluffs running along the coast. The inlet is navigable for approximately 1.75 miles. In June 1978, the controlling depth was 6 ft with a width of about 100 ft, from the entrance up to Old Mill Road, a distance of about 0.75 mile. Mid-channel depth past this point is 6 ft up to the turning basin at the end of the inlet. Approximately 1.0 mile from the entrance an overhead cable crosses the water with a clearance of 78 ft. About 0.2 mile below this is the remains of the Old Mill Road Bridge (Ref. 1). The inlet was dredged recently and adequate drafts presently exist for vessels using the channel (Ref. 2,3). The mean tidal range is 5 ft at the entrance (Ref. 1).

The sides of the channel are sandy and although shoaling may occur, especially near the entrance, it poses no serious navigation threat.

Mattituck Inlet can be reached by land via Routes 25 and A25 which meet at the lower end of the inlet. From this vicinity other roads such as Cox Neck Road and North Road provide access to areas around the inlet. The Long Island Railroad runs through the town of Mattituck but does not provide direct access to the water (Ref. 4).

2.0 Harbor Uses

2.1 Industrial/Commercial

While commercial facilities utilizing waterborne transport exist in Mattituck Harbor, the volume received makes the harbor one of the more inactive along Long Island. In 1978, 702 tons of fish, including shellfish, 1336 tons of gasoline, and 1256 tons of distillate fuel oil were handled. During this year, 2105 trips were made by self-propelled dry cargo vessels and 2 by non-propelled tankers (Ref. 5). The frequency that vessels deliver cargo is above average for small commerical harbors; just the volume accommodated is fairly insignificant. All vessels had a draft of 8 ft or less.

2.2 Recreational

Marinas located in Mattituck Inlet have limited availability of slips, although space for transients is maintained (Ref. 2,3,6). Recreational boat traffic is largely from power boat use. An increase in sailboat use is foreseen, however. Power vessels up to 65 ft can be accommodated. Large size sailboats are limited in the use of the inlet because of their deeper draft requirements. A trend towards slightly larger and

wider boats may exist. Retail sales in the area reflect this trend. Boater traffic is heaviest on the weekends and more boaters are using their craft as floating bungalos at dockside (Ref. 2,3).

No.	Marina	# of Slips	Maximum Size
1	Mattituck Fishing Station & Marina	30	35' (power)
2	Mattituck Inlet Marina	60	65' (power)
3	Mattituck Park District Marina	20	35' (power)
4	Matt-A-Mar Inc.	81	60' (power)
		191	

3.0 Projection of Harbor Activity

Increased harbor activity is foreseen in the coming years consisting of recreational boating (Ref. 2,3). This has resulted in at least one marina owner to consider expansion if the numerous permits required for this work can be obtained (Ref. 2). The section of Mattituck surrounding the inlet is less developed than other sections of the town, and is expected to undergo some growth in the future, although not industrial in nature (Ref. 7). At present a need for new dredging does not exist, but maintenance dredging at some future time may be of benefit. This is especially true, if large size sailboats are to remain and be attracted to the area (Ref. 2,3).

References

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2 Private Communication (Al Van Name, Matt-A-Mar Marina), June, 1981.

3 Private Communication (Dave Boscola, Mattituck Inlet Marina), June, 1981.

4 John J. McMullen Associates, Inc. An Inventory of Ports, Commercial Facilities and Commodity Movements on Long Island Sound. Prepared for The Eastern Regin Ports and Intermodal Systems Office, Maritime Administration, U.S. Department of Commerce, New York, NY, June 25, 1975.

5 U.S. Department of the Army, Corps of Engineers. Waterborne Commerce of the United States, Calendar Year 1978, Part 1, Waterways and Harbors Atlantic Coast. U.S. Engineer Division, New England, Waltham, MA, 1978.

6 Boating Almanac, Vol. 2, Boating Almanac Co., Inc., Severna Park, MD, 1981.

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GREENPORT HARBOR

1.0 Harbor Description

Greenport Harbor is located just northeast of the town of Greenport, due west of Hay Beach Point on Shelter Island, and about 7 miles southwest of Orient Point. The harbor boundaries are a 5-ft high breakwater extending .2 mile southeast from Young's Point to the east, and Fanning Point to the west. Water depths in the outer region of the harbor are very deep, with 79 ft reported in one spot. Just to the west of Young Point a narrow inlet leads to a completely sheltered portion of the harbor, called Stirling Basin, where two privately dredged channels had a depth of 9 ft in 1980 (Ref. 1). The natural channel in the inlet has a depth of as much as 28 ft in places (Ref. 2). There are few navigational difficulties (Ref. 1,2,3), and the mean tidal range is 2.5 ft. Currents of about 2 knots happen 3 hours after slack water in the inlet to Stirling Basin (Ref. 4).

Route 25 passes within 1/4 mile and the Long Island Railroad has its terminus in Greenport.

2.0 Harbor Uses

2.1 Industrial/Commercial

Fuel oil is the primary import by waterborne transport, with 26,662 tons of gasoline and distillate fuel oil brought in during 1978. In addition, 1740 tons of fresh fish, and 178 tons of unprepared shellfish were also handled for the same year (Ref. 5). This required 24,816 trips by dry cargo vessels, and 2 trips by tankers that were self-propelled, as well as 18 trips by non-propelled tankers. All vessels had a draft of 14 ft or less (Ref. 5). There are also recreational ship builders, and a firm that specializes in constructing docks, jetties, and bulkheads (Ref. 4), as well as a ferry to Shelter Island.

2.2 Recreational

Three marinas use Greenport Harbor, and are all located in Stirling Basin (Ref. 4).

No.	Marina	# of Slips	Maximum Size
1	Stirling Harbor Shipyard and Marina	180	100' (power)
2	Townsend Manor Marina	50	50' (power)
3	Harborhaven	30	35' (power)
		260	

Anchorage space is presently being used to capacity and there is demand for more, though fuel prices and availability do have significant effect in this mainly powerboat community (Ref. 2,3). Transition to sailboats is slow overall, but still definite (Ref. 2). There are indications that general economic conditions are causing boaters to travel less often, though the range of time, Thursday to Monday for most, is expected to continue (Ref. 2,3).

3.0 Projection of Harbor Activities

Overall activity is remaining fairly stationary. While not much shorefront land is available (Ref. 2,3), an old shipyard may be the site of a new condominium complex (Ref. 2). Normal maintenance dredging of area facilities is all that would seem needed, and a "no-action" scenario would only continue what has been occurring up to this time. If private interests became unable to finance maintenance dredging in the future, or if extreme environmental detriment made such dredging impossible; even then the impact would be minimal for quite a few years.

References

1 U.S. Department of Commerce. United States Coast Pilot. Atlantic Coast: Cape Cod to Sandy Hook. 15th Edition. National Ocean Survey, Washington, D.C., January 1980.

2 Private Communication (Mrs. Muff, Stirling Harbor Shipyard), June 4, 1981.

3 Private Communication (Richard Gonzales, Townsend Manor Marina), June 4, 1981.

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